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SESSIONAL PAPERS.

VOL. XLIII.—PART II.

THIRD SESSION

OF THE

TWELFTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO.

SESSION 1911.

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No. 8... Report of the Provincial Municipal Auditor, for the year 1910. Presented to the Legislature, 15th March, 1911. *Printed.*

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No. 10... Report of the Inspector of Insurance and Registrar of Friendly Societies, for the year 1910. Presented to the Legislature, 3rd February, 1911. *Printed.*

No. 11... Financial Statements made by Loan Corporations, Building Societies, Loaning Land Companies and Trust Companies, for the year 1910. Presented to the Legislature, 3rd February, 1911. *Printed.*

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No. 14... Report on Highway Improvement in the Province, for the year 1910. Presented to the Legislature, 15th March, 1911. *Printed.*

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No. 21... Report on the Hospitals for the Insane, for the year 1910. Presented to the Legislature, 15th March, 1911. *Printed.*

No. 22... Report on the Hospitals for Idiots and Epileptics, for the year 1910. Presented to the Legislature, 15th March, 1911. *Printed.*

No. 23... Report upon the Feeble-Minded, for the year 1910. Presented to the Legislature, 22nd March, 1911. *Printed.*

No. 24... Report upon the Hospitals and Charities, for the year 1910. Presented to the Legislature, 15th March, 1911. *Printed.*

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No. 26... Report upon Neglected and Dependent Children, for the year 1910. Presented to the Legislature, 8th March, 1911. *Printed.*

No. 27... Report upon the Operation of the Liquor License Acts, for the year 1910. Presented to the Legislature, 15th March, 1910. *Printed.*

No. 28... Report of the Department of Agriculture, for 1910.*
*This Report was printed in the Sessional Papers of 1910—No. 28.

No. 29... Report of the Agricultural College and Agricultural Farm, for the year 1910. Presented to the Legislature, 16th March, 1911. *Printed.*

No. 30... Report of the Ontario Vetrinary College, for the year 1910. Presented to the Legislature, 20th March, 1911. *Printed.*

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No. 35... Report of the Corn Growers' Association, for the year 1910. Presented to the Legislature, 20th March, 1911. *Printed.*

No. 36... Report of the Entomological Society of Ontario, for the year 1910. Presented to the Legislature, 16th March, 1911. *Printed.*

No. 37... Report of the Ontario Bee-Keepers' Associations, for the year 1910. Presented to the Legislature, 20th March, 1911. *Printed.*

No. 38... Report of the Dairymen's Associations of Ontario, for the year 1910. Presented to the Legislature, 16th March, 1911. *Printed.*

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No. 39.... Report of the Live Stock Associations of Ontario, for the year 1910. Presented to the Legislature, 3rd February, 1911. *Printed.*

No. 40... Report of the Farmers' Institutes of Ontario, for the year 1910. Presented to the Legislature, 26th January, 1911. *Printed.*

No. 41... Report of the Women's Institutes of Ontario, for the year 1910. Presented to the Legislature, 26th January, 1911. *Printed.*

No. 42... Report of the Poultry Institute, for 1910.*
* This Report was not presented in the Session of 1911.

No. 43... Report of the Agricultural Societies of Ontario, and the Convention of the Ontario Association of Fairs and Exhibitions, for the year 1910. Presented to the Legislature, 26th January, 1911. *Printed.*

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No. 45... Report of the Bureau of Industries, for the year 1910. Presented to the Legislature, 20th March, 1911. *Printed.*

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No. 47... Report of the Temiskaming and Northern Ontario Railway, for the year ending 31st October, 1910. Presented to the Legislature, 25th January, 1911. *Printed.*

No.. 48... Report of the Hydro-Electric Power Commission, for the year 1910. Presented to the Legislature, 22nd March, 1911. *Printed.*

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No. 49... Report of the Ontario Railway and Municipal Board, for the year 1910. Presented to the Legislature, 28th February, 1911. *Printed.*

No. 50... Supplementary Return from the Records of Elections subsequent to General Elections in 1908. Presented to the Legislature, 24th January, 1911. *Printed.*

No. 51... Copies of Regulations and Orders in Council respecting Department of Education. Presented to the Legislature, 25th January, 1911. *Not Printed.*

No. 52... Report on the State of the Legislative Library. Presented to the Legislature, 31st January, 1911. *Printed.*

No. 53... Report *re* Game Commission.*
** Not brought down.*

No. 54... Statements of Provincial Auditor under Audit Act. Presented to the Legislature, 25th January, 1911. *Printed.*

No. 55... Copies of Orders in Council under provisions of Surrogate Courts Act. Presented to the Legislature, 3rd February, 1911. *Not Printed.*

No. 56... New Ontario, Situation, Farms, etc. Presented to the Legislature, 3rd February, 1911. *Printed for distribution only.*

No. 57... Dairying in Ontario. Presented to the Legislature, 3rd February, 1911. *Printed for distribution only.*

No. 58... Farming Opportunities in Ontario. Presented to the Legislature, 3rd February, 1911. *Printed for distribution only.*

No. 59... Women's Institutes, Hand-Book. Presented to the Legislature, 9th February, 1911. *Printed for distribution only.*

No. 60... Report on Infant Mortality. Presented to the Legislature, 7th March, 1911. *Printed.*

No. 61... Return to an Order of the House of the 21st day of February, 1911, for a Return shewing: The number of officials, clerks and employees in the various branches of the Provincial Secretary's Department on (*a*) February 1st, 1905; (*b*) January 1st, 1911; with the salaries in each case. The additional work (if any) imposed on each branch and a statement of what has been accomplished thereby. Presented to the Legislature, 15th March, 1911. Mr. *McCart. Not Printed.*

No. 62... Return to an Order of the House of the 20th day of February, 1911, for a return shewing: (*a*) For what commodities supplied to the Public Institutions under the control of the Province of Ontario the Government asks for tenders by advertisement in the public press; (*b*) The commodities supplied to each of the Public Institutions under the control of the Province of Ontario for which tenders are not invited by advertisement in the public press; (*c*) and what system of purchase is adopted in each case under (*a*). Presented to the Legislature, 15th March, 1911. Mr. *Kohler. Not Printed.*

No. 63... Statement of distribution of Revised and Sessional Statutes, for the year 1910. Presented to the Legislature, 15th March, 1911. *Not Printed.*

No. 64... Report of Bureau of Colonization, for the year 1910. Presented to the Legislature, 16th March, 1911. *Printed.*

No. 65... Report, Provincial Archives, for the year 1910. Presented to the Legislature, 20th March, 1911. *Printed.*

No. 66... Return to an Order of the House of the Tenth day of February, 1911, a Return shewing: (1) The amount expended on the revision of the Statutes from the 14th day of February, A.D. 1910; (2) To whom and on what account were the payments made; (3) The total cost of revision to date and shewing: (4) When will the revision be completed. Presented to the Legislature, 20th March, 1911. Mr. *Proudfoot. Not Printed.*

No. 67... Return to an Order of the House of the Twenty-eighth day of February, 1911, for a Return shewing the uniform system of accounting in respect to the various features of the dealing in electric energy by municipalities having contracts with the Hydro-Electric Power Commission which has been approved by the Government. Presented to the Legislature, 20th March, 1911. Mr. *MacKay* (*Grey.*) *Not Printed.*

No. 68... Return to an Order of the House of the Twenty-eighth day of February, 1911, for a Return shewing: (*a*) The institutions under the control of the Province which are supplied with electric power by the Hydro-Electric Power Commission; (*b*) The amount of power supplied in each case, and the date when such power was first supplied; (*c*) The price charged to each such institution for power; (*d*) The cost of installation in each case; (*e*) The system of supplying power displaced by the supplying by the said Commission; (*f*) The cost of the same amount of power under the displaced system; (*g*) The cost price of the plant rendered useless by the change in each case; and (*h*) What other institutions under the control of the Province are to be supplied with electric power by the said Commission. Presented to the Legislature, 20th March, 1911. Mr. *MacKay* (*Grey.*) *Not Printed.*

No. 69... Return to an Order of the House of the Twenty-eighth day of February, 1911, for a Return shewing: (*a*) The damage done to the machinery or equipment in any and all transformer stations of the municipalities contracting with the Hydro-Electric Power Commission since the said Commission commenced to transmit power; (*b*) The dates upon which such damage was occasioned and the extent in money of the damage to machinery or equipment in each case; (*c*) The names of the contractors supplying or installing the machinery or equipment so damaged; (*d*) The cause of the damage in each case, together with all reports received by the Government or any member thereof or the said Commission as to the cause in each case; (*e*) Upon whom will the loss in each case fall—Upon the said Commission, upon the contractor or upon the interested municipality. Presented to the Legislature, 20th March, 1911. Mr. *MacKay* (*Grey.*) *Not Printed.*

No. 70... Return to an Order of the House of the Twenty-eighth day of February, 1911, for a Return shewing: (*a*) How much power has been called for by the Hydro-Electric Power Commission under its agreement

with the Ontario Power Company, giving date of each notice requiring delivery of power, and the amount called for by each notice; (*b*) The amount of power for which the said Commission is now and has been from time to time liable to pay; (*c*) The amount of Power annually taken from time to time from the Ontario Power Company; (*d*) The amount of power actually transmitted from time to time by the said Commission; (*e*) The dates and duration of all interruptions to the delivery of power by the said Commission to the various contracting municipalities; (*f*) The cause of each such interruption, and all reports thereon received by the said Commission or the Government or any member thereof; (*g*) The amount, if any, of the rebate allowed or to be allowed each contracting municipality in consequence of the interruption of the delivery of power. Presented to the Legislature, 20th March, 1911. Mr. *MacKay* (*Grey.*) *Not Printed.*

No. 71... Return to an Order of the House of the Twenty-first day of February, 1911, for a Return shewing: (*a*) The municipalities which have entered into contracts with the Hydro-Electric Power Commission for the supply of power; (*b*) The amount of power contracted for by each such municipality; (*c*) The names of the municipalities to which power is now actually being supplied, with the date upon which power was first supplied, the amount of power now supplied, and the amount of power actually used or sold by each such municipality; (*d*) The actual amount for which such municipality being supplied with power has become liable to the Commission, and the date from which such liability runs. Presented to the Legislature, 20th March, 1911. Mr. *MacKay* (*Grey.*) *Not Printed.*

No. 72... Return to an Order of the House of the Eighth day of February, 1911, for a Return, shewing the names of all temporary or extra game wardens appointed during the seasons 1909 and 1910, with the residence and description of each appointee, the amount paid to each for services and expenses, the locality assigned to each, and the number and general nature of reports received from such game wardens. Presented to the Legislature, 20th March, 1911. Mr. *Elliott. Not Printed.*

No. 73... Return to an Order of the House of the Twenty-seventh day of February, 1911, for a Return shewing (1) A copy of the advertisement calling for tenders for the printing, publishing and supplying of "Ontario Readers"; (2) Copies of all tenders received; (3) Copies of correspondence between the Government of Ontario or any official thereof and any tenderer or tenderers; (4) A copy of the contract entered into on behalf of the Government for the printing, publishing and supplying of "Ontario Readers"; (5) A detailed statement of the cost to the Government of supplying to the publishers electro-plates for each Reader; (6) Comparison of the prices of the old textbooks in the Public and High Schools with those of the corresponding text-books in the new series; (7) Amounts saved to purchasers,

estimated on the basis of previous sales and attendance; (8) Methods of safeguarding the quality of the materials entering into the construction of the text-books and their printing and binding; (9) What provinces, if any, have adopted books of Ontario's new series. Presented to the Legislature, 20th March, 1911. Mr. *Musgrove. Printed.*

No. 74... Return to an Order of the House of the Twenty-first day of February, 1911, for a Return shewing (1) From what date is the Hydro-Electric Commission entitled to payment by the City of Toronto for electrical power contracted for by the City from the said Commission, and if (2) The Commission has been paid the amount owing by the City from said date; (3) What amount *per* month has the City of Toronto become liable to pay to the Hydro-Electric Commission for such power, and from what date. If not paid the reason therefor, and is the City liable to pay interest on such arrears. Presented to the Legislature, 21st March, 1911. Mr. *Proudfoot. Not Printed.*

REPORT

OF THE

Minister of Lands, Forests and Mines

OF THE

PROVINCE OF ONTARIO

For Year Ending 31st October

1910

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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REPORT OF THE

Minister of Lands, Forests and Mines

OF THE

PROVINCE OF ONTARIO

For the Year Ending 31st October, 1910.

To His Honour The Honourable J. M. Gibson,
Lieutenant-Governor of the Province of Ontario.

May it Please Your Honour:

As required by law, I submit for the information of your Honour and the Legislative Assembly a report of the management of the Crown Lands of the Province for the year ending 31st October, 1910.

Clergy Lands.

The amount collected on account of sales of clergy lands was $908.35. (See Appendix No. 3, page 7.)

Common School Lands.

The area of these lands sold during the year was 20½ acres for $70.95. The collection on account of these and former sales was $8,486.59. (See Appendix No. 3, page 7.)

Grammar School Lands.

The area of these lands sold during the year was 16.40 acres for $16.40. The collection on account of these and former sales was $390.40. (See Appendix No. 3, page 7.)

University Lands.

The area of these lands sold during the year was 4,019.95 for $2,109.35. The collection on account of these and former sales was $1,072,08. (See Appendix No. 3, page 7.)

Crown Lands.

There was sold for agricultural purposes during the year 92,560 acres for $127,151.01. There was collected on account of these and former sales $104,949.35. There was sold for mining purposes 17,275.94 acres for $425,331.53. There was collected on account of these sales $327,160.12. There was leased for mining purposes 9,028.86 acres for $10,249.39. There was collected on account of mining leases $29,008.79. There were 4,782.77 acres leased for other than

mining purposes and collected on account of Crown Leases $7,469.66. The total area of lands of the Crown disposed of during the year was 127,704.48, and the total collection on account of lands sold and leased was $479,445.34. (See Appendix No. 3, page 7.)

The Temiskaming region has continued to attract the attention of settlers. As soon as the Transcontinental Railway is in operation there will no doubt be a large influx of people to the clay belt through which that railway runs.

The Porcupine discoveries and developments have caused considerable excitement, and large numbers of prospectors and others have been attracted to that region. The exploration and working of the mines will give employment to a great many people and create a market there for all kinds of natural products. The construction of the Porcupine Branch of the T. & N.O. Railway will not only give access to that region for mining purposes, but will open up as well a large area of land suitable for agricultural purposes.

The Department has continued and extended the system of inspection of lands taken up for settlement purposes in order to enforce the conditions of building, residence and clearing so as to prevent lands being held for speculation purposes, or the cutting of timber. Where settlement conditions are not carried out according to the regulations, the sales are cancelled, the lands resumed and again opened for sale. The knowledge that the Department intends to strictly enforce the performance of settlement conditions has had a good effect in causing people to go into residence upon their lands and remain there.

The further surveys and explorations which have been made in the clay belt have demonstrated the reasonableness of the estimates made of the area of land suitable for settlement in that immense region, which is destined to be one of the most valuable agricultural sections of the Province, capable of supporting a large population by the products of the soil, and incidentally causing manufactures and business of various kinds to spring up.

Free Grants.

There are still considerable areas of land suitable for settlement available in the Free Grant districts, although in many of these districts the best land has been taken up. There is a desire on the part of many to move to the West and to the clay belt of Ontario, where the land is better and greater opportunities are available.

The Township of Wabigoon, near the Town of Dryden in the Rainy River District, has been opened for location, and part of the Township of Ware in the Thunder Bay District. The Department is, by inspection, enforcing the performance of settlement duties and cancelling those locations where there is a default in the conditions. The Department is also endeavoring to prevent lands that are unsuitable for farming being located merely for the purpose of getting the timber. The number of locations during the year has been 1,379 for 194,760 acres, and 946 locatees have earned and obtained their patents.

Military Grants.

The total number of Military Certificates issued to date, under I. Edward VII., cap. 6, is 13,993.

Eighty-five Location Certificates were issued this year and 300 new locations were made, bringing the total number of locations to 7,495.

Ninety Certificates were surrendered to the Crown for $50.00 each, making a total of 3,301 disposed of in this way.

Six hundred and fifty Certificates have been applied in payment for Crown Lands.

This, therefore, shows that 11,446 certificates have been redeemed, leaving 2,547 still outstanding.

When certificates were issued and assigned, assignees became liable to the performance of settlement duties, and this condition also applies where there was more than one military location to the mile in townships not specially opened for veteran locations.

Four hundred and thirty-four notices issued to military settlers and assignees of veterans calling upon them to show that they were in actual occupation and the nature of the duties they had performed upon the land, resulted in the cancellation of 261 locations for non-performance of conditions.

Patents were issued during the year for 1,238 locations, making a total of 3,889 patents issued to date.

The Mining Industry.

The mining industry of the Province continues to expand. The two metals which lead in point of production are silver and nickel. The output of silver from the mines of Cobalt for the year ending 31st October, 1910, was nearly 27 million ounces. The total production of these mines since their opening in 1904 will, by 31st December, 1910, have amounted to 92 or 93 million ounces, having a value of say 50 millions of dollars. The ores of Cobalt are yet far from being exhausted, and may be expected to yield liberally for years to come.

The nickel mines of the Sudbury region have also been increasing their production, the quantity of nickel produced during the 12 months ending 31st October being about 19,000 tons, valued in the matte at $3,860,000, in addition to about 9,400 tons of copper. The operating companies have improved their facilities for mining and smelting, and much the larger proportion of the world's supply of nickel now comes, and for several years past has come, from the mines of Ontario.

The discoveries of gold at Porcupine, noted in last year's Report, have undergone vigorous development during the year, and the results so far have encouraged the hope that the field may prove a valuable one. Shafts at various points have been sunk, and large stamp-mills for the treatment of the quartz are to be erected on the Hollinger and Dome properties. Doubtless other prospects will be similarly equipped should the indications of richness and permanency at depth be favorable. A branch of the Temiskaming & Northern Ontario Railway is to be constructed into Porcupine, and will afford the new field first-class facilities for getting in machinery and supplies.

It is a fortunate circumstance that the mineral regions of Ontario are well supplied with water-powers. So far as fuel is concerned, the evolution of a mining camp in Ontario is marked by three stages: first, that in which wood is used; second, coal; third, water-power. At the beginning of operations wood is usually abundant, but the available supply soon becomes exhausted, and the expense of bringing it from a distance makes the cost too great. Coal is then brought in by rail, but freights from Pennsylvania make it dear. The next step, should the apparent life of the camp warrant it, is to harness one or more of the numerous water-powers generally found in the vicinity, and ere long the mines and works are equipped with electrical power, at a cost of one-half or even one-third that of power

generated from coal. This has been the experience of the nickel mines at Sudbury, the silver field at Cobalt, the iron mines at Michipicoten, and the group of mineral industries in Hastings county, including pyrite and acid-making, talc, the manufacture of Portland cement, and the refining of Cobalt silver ores; not to mention the vast development of electrical power at Sault Ste. Marie and Niagara Falls.

Collections.

The total collections of the Department from all sources for the year were $2,951,428.58. Of this amount $327,160.12 was derived from mining lands; $246,529.13 from royalties; $1,835,082.71 from woods and forests; $143,209.59 from supplementary revenue; $84,059.49 from mining licenses and $109,622.99 from recording fees. (See Appendix No. 4, page 8.)

Disbursements.

The gross expenditure of the Department for all services during the year was $625,375.71. The principal services were: Agents' salaries and disbursements, $49,791.94; forest ranging, $77,503.95; fire ranging, $128,634.05; forest reserves, $78,245.30; mines and mining, $21,295.80; explorations and investigations, $17,578.55; mining recorders, $32,597.90; surveys, $129,338.51; veterans' commutation, $2,050.00; refunds, $13,587.21; parks, $15,724.28; contingencies, $27,594.11. (See Appendices Nos. 5 and 7, pages 10 to 34.)

Woods and Forests.

The total revenue from woods and forests for the year 1910 is $1,835,082.71. Of this $1,634,496.21 appears as timber dues: Deposits on account of timber sales, $92,396.36; ground rent, $104,326.64, and transfer bonus, $3,863.50. It is proper to say that the item of timber dues includes approximately $200,000 bonus as timber was cut. Had timber sales been by the mile, as formerly, this amount would have appeared under the head of bonus. Until all the accruals for the year are paid in, it is not possible to give the exact figures of bonus revenue, but if this $200,000 is credited to bonus the fact remains that the collection of timber dues is still the largest in the history of the Department. The revenue for the year just closed is the first full year's revenue under the new system of having the financial year end on the 31st of October instead of the 31st of December, as formerly was the case. The revenue from ground rent is also the largest in the history of the Department, which is caused by the increase made in the amount of the annual ground rent payable from $3. to $5. per mile, which change took effect for the first time for the season of 1910-11. The charge for transfer bonus was also raised from $3. to $5. per mile, which sensibly increased the small revenue derived from this source. An Order-in-Council was also passed increasing the dues payable on timber when cut on those berths sold previous to 1890 from $1. to $1.50 per thousand feet board measure, but as this increase did not affect the cut of 1909-10 no benefit has been experienced from it this year. The revenue from bonuses was not as large as it would have been had the timber berths offered not been damaged by fire, and financial stringency prevailed, which made it necessary to make the deposits as low as possible so as to ensure competition for the damaged timber.

I pointed out in my last report that the system of issuing permits had been brought to an end, and in order that those engaged in lumbering who had invested

in large plants and mills should not have their investments wiped out, it was necessary to give them an opportunity to acquire timber at public sales in the ordinary way. The only permits now existing are on the Transcontinental Railway, where if the railway was to be built contractors had to be permitted to cut ties, etc.

During the past year very serious forest fires occurred in the territory west of Lake Superior, and a very considerable area was burnt over. A good deal of this territory had been lumbered over under authority of permit in years gone by, and the small quantity of timber remaining was not of a first quality, being rough and scattered. It was, however, important to get for the Province the money value of it. Immediately on receipt of information that fires had occurred rangers were put on to examine and estimate the territory, and surveyors were sent to define the berths so they might be offered for sale. The territory to be sold was cut up into very small berths so as to give the widest possible competition by allowing the small operator to come in. The damaged timber was sold by the thousand feet board measure. The timber being damaged and scattered, the prices were not as high as they would have been for green timber, and the licensees having large quantities of their own timber damaged which they had to take care of, the competition was not as keen as it otherwise would have been, but, having regard to all the circumstances, the sale was satisfactory.

During the past winter the cutting of timber damaged by fire in the Mississaga Forest Reserve was proceeded with under the supervision of a carefully selected staff of rangers and scalers appointed by the Department, whose count and measurements were final for revenue purposes. The considerable prices to be paid for this timber made it necessary that very close measurements should be made, and that the cutting should be carried on in an economical manner as respects the character and size of the trees to be cut, as well as making allowances for timber damaged by fire, and the other defects usually found in timber. In order to prevent disputes the cullers were required to put on the end of the log, in black chalk, the contents they allowed, so that the lumberman might see that he was getting a fair measurement, and the Crown ranger, whose business it was to check up the measurements of the cullers, might do so with readiness and thoroughness. Although there were differences of opinion between the operators and the Government scalers, they were not serious and the accounts were based on the measurements of the Department's officers. This system of measurement and supervision of cutting is now applied to all sales made by the thousand feet board measure system. It was estimated that the output for 1909-10 would be 100,000,000 feet in excess of the previous year. As a matter of fact, the output of Pine was about 142,000,000 in excess of 1908-09. The estimate for the present winter of 1910-11 is that there will be an increased output of about $50,000,000 feet B.M.

Fire Ranging.

During the past year an important departure was made in respect to fire ranging on licensed territory. The stumpage value of timber had greatly increased, but this increase had inured to the benefit of the timber licensees. The time seemed to have arrived when the licensees should bear the whole cost of the fire-ranging and protection of their timber. In considering the question of increasing timber dues and ground rent, the matter of the cost of fire-ranging came up, and it was understood and agreed to that the whole expense, except as regards printing literature, copies of the Fire Act, diaries, etc., should be borne by the licensees; therefore, this year, the timber licensees have borne the entire cost of

fire-ranging on licensed territory. There has, however, been no change in the supervision of the fire-ranging on licensed lands. The licensees have still to submit the number of men and the names of the fire-rangers they propose to employ, and the limits on which they are to be placed. The Department instructs the rangers as to the performance of their duties. It supplies them with literature and copies of the Fire Act,—pamphlet and poster. It clothes them with authority as Government officers; appoints them fish and game wardens, and furnishes them with diaries in which they have to enter their movements from day to day,—which diaries have to be sent in to the Department at the end of the season, verified by the affidavit of the rangers. Rangers are required to report all serious fires to the Department, as well as to the licensee. The Department requires that fire rangers shall be placed on all limits, and if the licensees fail to put them on, the Department undertakes that duty and charges the expense against the berths for which it appoints the rangers, and makes the charge a lien on the berth, which must be removed before a license will be renewed. The licensed territory is divided into districts of convenient size, for purposes of supervision, and experienced bush rangers are placed in charge of the fire rangers in each district. This superintendent has the direction and supervision of all fire rangers under his care; sees that they are placed on all limits; that they are discharging their duties properly, and generally represents the Department and the licensee. In the event of a serious fire taking place, the district ranger takes charge and directs the work of suppression, and on the fire being extinguished reports fully to the Department where the fire occurred, its cause (if it is possible to ascertain this), the quantity of timber damaged, and all other particulars. Thus it will be seen that the Department has not parted in the slightest degree with its supervision and control of the service,—the sole change being that the licensees pay the expense of fire-ranging on their licensed territory.

It may here be stated that there were no forest fires of any consequence on licensed territory east of Port Arthur during the past year. The supervision was evidently close, and the result satisfactory. There is no doubt that the constant presence of fire rangers, year after year, calling attention to the danger of setting out fire, inculcating a spirit of carefulness and responsibility, and the distribution of the Fire Act and other literature, has had an educative effect, and we are now reaping the benefit of this service by immunity from serious fires during the past year.

In the region west of Port Arthur, especially in the Fort Frances district, the summer was very dry and warm. Indeed it was said to be the driest summer for a period of thirty years. No rain fell and in consequence the forest was in a highly inflammable state. Serious forest fires took place on licensed territory there and on lands of the Crown, away from settlement or railways, and large quantities of Pine timber were seriously damaged. This timber is being taken out during the present winter, as the Department notified the licensees where the damaged timber was, and directed them to cut it, intimating that in the event of their failing to do so, they would be held accountable for the loss. Every effort was made to discover the cause of these fires, but in that immense region it is most difficult to ascertain who started it, or how any particular fire was set out. During such a dry summer as the past, fires may be expected to run with great rapidity, and the throwing down of a lighted match or cigarette would be sufficient to cause a conflagration of a serious character.

The railways have been blamed for carelessness, but, though careful enquiries were made, the Department was unable to bring home to any of them any careless-

ness in connection with their engines. Curious to note some of the most serious fires that occurred, were away from railway construction, settlement, or lumbering. On the other side of the boundary line, in the State of Minnesota, serious fires occurred, entailing great loss of life, and some of them crossed into Ontario. Fortunately we experienced no loss of life, although serious damage was done to the forest. There were on duty on licensed lands, during the past season, 427 fire rangers, all paid by the timber licensees.

Forest Reserves.

During the summer the usual fire-ranging staffs were placed on duty in the several forest reserves:—The Temagami, Mississaga, Nepigon, Quetico and the Eastern. On these reserves there were about 288 rangers on duty. In the Temagami Reserve, there has been great danger for some time, owing to the extensive exploring and mining for silver, which has been going on there, but during the past summer we have been fortunate enough to have escaped serious damage from fire. The explorers and miners, and summer tourists, of whom a great number visited this reserve during the summer months, appear to have exercised every care and precaution. At the northern end of this great reserve there has been great activity and prospecting incident to the gold discoveries which have taken place there. Next summer will no doubt see a tremendous influx of prospectors, miners and others, and we shall have to place a large staff on duty at that end of the reserve. It is possible that a railway will be constructed from the T. & N. O. into Porcupine at an early date, and there is also an agitation on foot to have a railway built into Gowganda, which will be an added source of danger. If we had not had very efficient fire-ranging in that reserve since the mining excitement began, the large quantity of Pine timber growing there would, in all probability, have gone up in smoke.

There have been no fires during the year in the Mississaga, the Nepigon or the Eastern Reserves, where adequate staffs of fire rangers were maintained. The great Nepigon Reserve is exposed to considerable risk, owing to the construction through the northern end of it of the Transcontinental railway. The Eastern Reserve has been carefully guarded and the forest growth is reported to be dense and thrifty on this territory, which was completely denuded of its Pine timber before being set apart as a Reserve. The Sibley Reserve is a small area, covering Thunder Cape,—the object being to keep that noble promontory clothed with timber. No fire has occurred there. The Quetico Reserve, in the Rainy River district,—the latest addition to our list of forest reserves,—suffered somewhat from forest fires during the past summer. As this reserve is away from settlement and railways, or lumbering, it was difficult to account for the fires, unless they had crossed from the Minnesota side, where serious fires raged for considerable periods. We had an adequate staff of rangers on duty in this Reserve, and every effort was made to protect it, and suppress fires when they occurred. We had to dispose of some areas in this Reserve, where the timber was seriously damaged, and it had to be cut to save its value for the Province. Serious fires occurred at other points in the Thunder Bay and Rainy River Districts. Altogether it was estimated that about one thousand miles of territory had been more or less damaged by fire. Part of this territory had been cut over some time ago under authority of permit, —some was partially cut over, and some was virgin territory. Our fire rangers had instructions to report at once to the chief rangers when fires occurred, and the chief rangers were requested to have estimates made of the damaged timber, and

the berths surveyed at the earliest possible moment, so that the timber could be advertised for sale and cut this winter, before becoming a total loss. The sale of the damaged timber, having regard to all the circumstances, was fairly satisfactory. The plain duty was to realize what we could for the Province, and this was promptly done. Some of the timber licensees had timber damaged on their own limits, which we were pressing them to cut, and consequently we had not the sharp competition for this damaged timber, that we otherwise would have had. We are expecting that the bulk of the seriously damaged timber will be cut this winter, and a further proportion next year, and that the actual waste may be kept considerably below 50,000,000 feet board measure.

Railways.

We have had large staffs of rangers along the Temiskaming and Northern Ontario, the Transcontinental, the Canadian Northern, and the Canadian Pacific. There is a very large number of men engaged in railway construction, through the northern part of the Province, from the boundary of Quebec to that of Manitoba,—a distance of nearly a thousand miles. A large percentage of this labor is foreign, with no knowledge of the laws or ways of this country,—not speaking English,—with no care or thought about the danger of using fire during the dry season, and yet constantly using it for a variety of purposes,—cooking, smudges, smoking and in other ways. The only hope of preventing this line of railway construction becoming a belt of fire, was by placing fire rangers along it, who constantly brought before the people employed the necessity for caution in the use of fire and extinguishing it when it had served its immediate purpose. The penalty of the law for neglect of care was also kept before these people, and the railway engineers, contractors and foremen, and all who were in authority were urged to keep before the labor element the danger from forest fires, and what they should do to prevent them. The presence of these fire rangers patrolling the line every day, kept their duty ever present to the railway authorities, and had an otherwise good effect upon the labor employed. If there had been no rangers there, fire would have been constantly, freely and dangerously used, and the forest alongside that road for a thousand miles would have become a waste.

There is a splendid spruce forest all along this line, capable of producing great traffic for the railway, inducing the erection of pulp and paper mills, and affording employment to thousands of people, who will, in the near future, find happy and prosperous homes in that great clay belt. It will require great effort and considerable expense to protect this timber, but it will well re-pay all the money spent for this purpose, if the timber is preserved.

The railways have been blamed as a prolific cause of forest fires. That railway construction causes forest destruction needs no argument, for the evidence in the back parts of the Province to those travelling through it, is plain to the eye. The authorities of all the great railways have assured the Department, time and again, that they are making every effort to prevent fires along their lines, and there is no doubt that this is true, as their property and public life are endangered by the occurrence of forest fires along lines of railway. The tremendous interest that has, for the past few years, been taken in the protection of the forest from destruction by fire, has no doubt spurred them on to every effort to prevent fires along their lines, and we may hope for more care, and a better state of affairs in the future.

The Conservation Commission of the Dominion is taking the matter up with a view to obtaining stringent legislation, to compel railways to exercise greater care,

and use better appliances than they have done in the past. We had about 200 fire rangers on duty along the various railway lines during the past summer. A proportion of the cost of these rangers was borne by the railways and a proportion by the Department.

The whole fire ranging staff on duty last summer on licensed lands, forest reserves, railways and Crown territory aggregated nearly one thousand men. It is a difficult matter, at the season of the year when fire rangers are most required, to obtain a number of well skilled bush men, who are educated and otherwise well-equipped for this work. In the early part of the summer, such men are still employed by the lumber companies in driving the streams, and again in the months of August and September, lumbering operations are beginning for the ensuing winter, and such men are looking for a winter's employment and will not stay on fire ranging when they can get better wages, and be sure of several months steady work. The Department has had to select a portion of its staff from other sources, and it has drawn upon the body of students at the School of Practical Science, at the University, and elsewhere for some of its fire rangers. These students are active men with some scientific training and give fairly good service, as soon as they get a little experience. If the Department could get thoroughly educated bush men with the necessary education and judgment, it would employ them to the exclusion of all others, but not being able to do that, it makes the next best selection possible. The men selected are put under competent chiefs, who fully instruct them in their work and see that they perform it. The greatest care is exercised in picking out the men best qualified for the position from those who apply. Higher attainments are being required each year, and stricter conditions enforced.

Cullers' Examinations.

Cullers' Examinations were held at North Bay, Kenora, Fort Frances and Port Arthur. Thirty candidates were successful at these examinations and were granted certificates, authorizing them to act as cullers.

(For list of cullers, see Appendix No. 37, page 104).

Crown Surveys.

The following Crown Surveys have been undertaken this year:—

Instructions for sub-division of four townships were issued, namely:—

District of Sudbury, township of Machin, and part of the township of Alexandra, District of Nipissing, residue of the townships of Maisonville and Benoit.

Instructions were also issued to survey the islands in the Georgian Bay, in front of the townships of Harrison, Shawanaga, Conger, Wallbridge, McDougall, Carling, etc.

Instructions also issued for a number of base and meridian lines and township outlines in the districts of Algoma, Nipissing, Sudbury, Kenora, Mississaga Forest Reserve and Temagami Forest Reserve.

The base and meridian lines were in the district of Algoma and there were 163 miles run.

Survey of outlines of townships in the districts of Sudbury, Nipissing, Kenora, Mississaga Forest Reserve and Temagami Forest Reserve, 1,119 miles run.

A number of timber berths in the districts of Kenora and Thunder Bay have also been surveyed during the year.

The survey of the town plots at Superior Junction and Redditt, district of Kenora, and town plot at Missanabie, district of Algoma, have also been completed.

Several other minor surveys have been performed.

The reports of the surveyors so far as received and examined will be found in Appendices 16 to 33 inclusive, pages 47 to 97 inclusive.

Municipal Surveys.

On the petitions of the county council of Carleton instructions were issued to survey the town line between the townships of Nepean and North Gower. Of the city of Hamilton, instructions have been issued to survey certain concession road allowances formerly in the township of Barton, now in the city of Hamilton. Of the united counties of Stormont, Dundas and Glengarry to survey the boundary road allowance between the townships of Osnabruck and Cornwall. Of the municipal council of the township of Nepean to survey the original road allowance between lot 30, concession 2, Ottawa front, and lots lettered J, K, L, M and N, concession A, Rideau front, in the township of Nepean.

The following municipal surveys have been confirmed under the provisions of the Revised Statutes of Ontario, 1897, chapter 181, sections 14 and 15, such surveys being final and conclusive. Part of the line between the township of Waterloo and the township of Guelph. The original road allowance between the broken front and the 1st concession of the township of Barton. The lines of the streets in the town of Niagara. Concession road allowance between the 10th and 11th concessions of Winchester. The southern boundary of the town of Niagara. The boundary lines of McArthur Ave. through the village of Eastview in the township of Gloucester. The side road between lots 9 and 10 in the 12th concession of the township of Nottawasaga. The concession line between the 8th and 9th concessions of the township of Hinchinbrooke from lot 12 south to lot 8.

Particulars relating to these surveys will be found in Appendices No. 14 and 15, pages 44 to 46.

Mining and Other Surveys.

The Mining Act of Ontario requires that applicants to purchase or lease mining lands in unsurveyed territory shall file in the Department surveyor's plans (in triplicate) of the proposed mining claims with field notes and description by metes and bounds, before any sale or lease can be carried out, and under Orders-in-Council, dated February 26th, 1906, 2nd October, 1907, 7th November, 1907, applicants to purchase islands, or locations for pleasure and summer resorts or for agricultural purposes in unsurveyed territory, are required to file surveyor's plans (in triplicate) of their islands or locations as the case may be, with field notes and descriptions by metes and bounds, together with the necessary affidavits as to there being no adverse claim by occupation or improvement, etc.

Under the above Act, Orders-in-Council and Regulations in the districts of Parry Sound, Nipissing, Sudbury, Algoma, Thunder Bay, Rainy River and Kenora, an area of 28,793.28 acres has been sold and patented during the year, for which the sum of $172,851.69 has been received, and an area of 7,550.83 acres has been leased for the sum of $8,180.17 as the first year's rental.

F. Cochrane,
Minister.

Department of Lands, Forests and Mines.
Toronto, October 31st, 1910.

APPENDICES

Appendix No. 1.

Return of Officers and Clerks of the Department of Lands, Forests and Mines for the year ending October 31st, 1910.

Branch.	Name.	Designation.	When appointed.	Salary per annum.	Remarks.
				$ c.	
	Hon. F. Cochrane	Minister	1905, May 13	6,000 00	
	Aubrey White	Deputy Minister	1882, Jan. 1	4,000 00	
	George Kennedy	Law Clerk	1872, Feb. 1	2,600 00	
	George W. Yates	Minister's Secretary	1899, Feb. 26	2,000 00	
	E. S. Williamson	Secretary to Department	1889, May 1	1,750 00	
	Janet Garvie	Stenographer	1905, Jan. 1	700 00	
	M. M. McCrea	do	1907, April 12	600 00	Resigned August 31st, 1910.
Sales and Free Grants	J. J. Murphy	Chief Clerk	1872, May 1	2,100 00	
	Walter C. Cain	Clerk	1903, March 6	1,500 00	
	W. R. Ledger	do	1894, Feb. 5	1,150 00	
	Selby Draper	do	1903, Jan. 1	1,150 00	
	S. A. Platt	do	1907, March 13	950 00	
	F. Lucas	do	1909, March 24	900 00	
	F. Samuels	do	1909, March 24	700 00	
	May Bengough	Stenographer	1896, Oct. 23	675 00	
	Jean C. Oram	do	1907, Jan. 16	625 00	
	Nan McQueen	do	1909, March 24	600 00	
Military Grants.	R. H. Browne	Chief Clerk	1900, March 2	1,750 00	
	R. T. Winter	Clerk	1904, Jan. 13	950 00	
	E. M. Browne	do	1909, March 24	575 00	
	E. F. O'Neil	Stenographer	1904, Nov. 9	600 00	
Surveys and Patents	G. B. Kirkpatrick	Director of Surveys	1866, Jan. 30	2,500 00	
	J. F. Whitson	Surveyor and Draughtsman	1892, Sept. 1	2,200 00	
	L. V. Rorke	Ass't Surveyor & Draughtsm'n	1909, May 1	2,000 00	
	W. F. Lewis	Clerk	1872, Feb. 5	1,200 00	
	D. G. Boyd	Draughtsman	1897, Sept. 27	1,400 00	
	E. M. Jarvis	Clerk	1904, Oct. 19	1,100 00	
	J. B. Proctor	do	1897, Jan. 15	1,000 00	
	H. Treeby	Draughtsman	1904, Jan. 13	1,050 00	
	F. C. Blanchet	do	1907, March 13	900 00	
	J. L. Byrne	do	1909, March 24	900 00	
	Alexander Leaman	do	1909, March 24	900 00	

	M. H. Kirkland	Stenographer	1904, Nov. 23	625 00	
	E. G. Halliday	do	1909, March 24	575 00	
	C. S. Jones	Chief Clerk	1890, May 22	1,850 00	
	C. E. Burns	Clerk	1900, April 9	1,150 00	
	W. S. Sutherland	Clerk	1902, Jan. 13	1,150 00	
	W. Carrell	do	1904, Jan. 15	1,050 00	
	A. E. Robillard	do	1894, May 8	900 00	
	A. E. Roe	do	1909, March 24	900 00	
	J. A. G. Crozier	Chief Clerk	1867, Dec. 1	2,100 00	
	Kenneth Miller	Clerk	1891, Nov. 1	1,350 00	Died January 10th, 1910.
	J. B. Cook	do	1898, Aug. 1	1,500 00	
	H. Gillard	do	1900, April 9	1,300 00	
	F. J. Niven	do	1903, March 6	1,100 00	
	W. F. Trivett	do	1904, Jan. 13	1,050 00	
Woods and Forests ...	R H. Hodgson	do	1904, Nov. 23	1,000 00	
	John Houser	do	1907, March 13	1,050 00	
	A. J. Lamb	do	1907, March 13	900 00	
	A. H. O'Neil	do	1909, March 24	800 00	
	G. W. Harris	do	1909, March 24	800 00	
	S. D. Meeking	do	1910, June 1	700 00	
	Florence Lennon	Stenographer	1907, March 13	600 00	
	Amy Thompson	do	1909, March 24	600 00	
	Mary E. Bliss	do	1909, Sept. 1	500 00	
	D. George Ross	Accountant	1861, April 15	2,300 00	
	E. Leigh	Clerk	1873, Dec. 20	1,200 00	
	H. M. Lount	do	1904, Jan. 13	1,300 00	
Accounts	H. E. Johnston	do	1907, March 13	1,050 00	
	H. G. Harris	do	1907, March 13	950 00	
	C. J. Clarke	do	1907, March 13	950 00	
	Frank Yeigh	Registrar	1880, March 1	1,500 00	
	Chester Dies	Clerk	1907, March 13	950 00	
	Thomas W. Gibson	Deputy Minister	1891, June 19	3,250 00	
	R. D. Fisher	Secretary	1907, March 13	1,100 00	
	W. H. Morris	Clerk	1907, March 13	950 00	
	R. A. Sinclair	do	1907, March 13	950 00	
	W. Lemoine	do	1908, April 8	950 00	
	A. Burritt	do	1908, April 8	950 00	
Bureau of Mines.	Anne Moffatt	do	1901, March 1	900 00	
	D. H. Barr	do	1907, March 13	950 00	

Appendix No. 1.—Continued.

Return of Officers and Clerks of the Department of Lands, Forests and Mines for the year ending October 31st, 1910.

Branch.	Name.	Designation.	When appointed.	Salary per annum.	Remarks.
Bureau of Mines.	A. G. Scovill	Clerk	1909, March 24	850 00	
	C. W. St. John	do	1910. April 14	800 00	
	Ethel Craig	Stenographer	1906, May 16	675 00	
	Flossie McDougall	do	1907, March 13	625 00	
	J. L. McNaughton	do	1909, March 24	625 00	
	H. Brophy	Messenger	1893, Oct. 1	750 00	

D. GEO. ROSS,
Accountant.

AUBREY WHITE,
Deputy Minister Lands and Forests.

Appendix No. 2.

List of Land Agents and Homestead Inspectors for the year ending October 31st. 1910.

Name.	Post office address.	District or county.	Date of appointment.	Salary per annum.	Remarks.
				$ c.	
Baker, R. H.	Minden	Part of Victoria	1907, Oct. 1	350 00	
Barr, James	Fort Frances	Homestead Inspector	1906, Nov. 23	1,200 00	
Both, Charles	Denbigh	Part of Frontenac and Addington	1905, Oct. 20	100 00	
Brown, J. B.	Bracebridge	Homestead Inspector and Crown Land Agent	1905, July 28	900 00	
Byers, R. J.	Massey	Part of District of Sudbury	1905, July 3	500 00	
Buchanan, T.	Thessalon	do do Algoma	1901, Nov. 30	300 00	
Burnes, C. W.	Parry Sound	Homestead Inspector	1905, Nov. 15	900 00	
Campbell, W.	Stratton Station.	Part of District of Rainy River	1897, Aug. 12	500 00	
Campbell, J. G.	Cochrane	do do Nipissing	1908, Nov. 19	500 00	
Chester, T.	New Liskeard	Homestead Inspector	1906, June 8	1,200 00	
Child, F. A.	Matheson	Part of District of Nipissing	1909, Jan. 8	500 00	
Dean, Thomas	Sault Ste. Marie	Homestead Inspector	1908, July 29	600 00	
Eastland, T. G.	Apsley	Part of County of Peterboro	1896, July 10	300 00	
Ellis, H. J.	Powassan	do District of Parry Sound	1909, May 21	500 00	
Freeborn, Dr. J. S.	Maganetawan	do do Parry Sound	1905, Nov. 10	500 00	
Grills, J. J.	New Liskeard	Lake Temiskaming, District of Nipissing	1905, July 3	500 00	
Groulx, R. J.	Chelmsford	Homestead Inspector	1906, May 7	600 00	
Hollands, C. J.	Fort Frances	Town Plot of Alberta and part of District of Rainy River	1892, Oct. 12	300 00	
Hughes, Thomas	Murillo	Homestead Inspector	1908, July 20	600 00	
Jenks, James	Mattawa	Part of District of Nipissing	1908, March 31.	500 00	Died June 25th, 1910.
Jenkin, William	Emsdale	do do Parry Sound	1908, July 29	500 00	
Keefer, H. A.	Port Arthur	do do Thunder Bay	1907, Oct. 30	500 00	
Lemieux, J A.	Blezard Valley	do do Sudbury	1908, June 26	400 00	
MacLennan, J. K.	Sudbury	do do Sudbury	1905, July 3	500 00	
McFayden, Alex	Emo	do do Rainy River	1905, Sept. 8	500 00	
Parsons, W. J.	North Bay	do do Nipissing	1908, April 8	500 00	
Philion, J. A.	Sturgeon Falls	do do Nipissing	1907, Sept. 13.	500 00	
Powell, F. R.	Parry Sound	do do Parry Sound	1907, May 31.	500 00	
Prince, Adam	Wilno	do Renfrew	1905, July 12	500 00	
Pronger, R. H.	Dryden	do District of Rainy River	1906, May 7	400 00	
Quenneville, I.	Sturgeon Falls	Homestead Inspector	1906, May 7	600 00	

Appendix No. 2.—Continued.

List of Land Agents and Homestead Inspectors for the year ending October 31st, 1910.—*Continued.*

Name.	Post office address.	District or county.	Date of appointment.	Salary per annum.	Remarks.
Rothwell, B. J.	Sault Ste. Marie.	Part of District of Algoma.....	1909, March 1..	300 00	
Smith, James	Kenora	Homestead Inspector	1909, June 18...	3 00	per day while employed.
Small, Robert	Mattawa	Part of District of Nipissing	1910. June 30...	500 00	
Spry, W. L.....	Kenora	do do Rainy River.....	1909, Sept. 21 ..	400 00	Also Mining Recorder.
Tait, J. R.	L'Amable	Part of Hastings.....	1869, May 28 ..	500 00	
Wilson, James	Kinmount	do Peterboro.....	1905, May 31...	150 00	
Warren, D. B.	Pembroke	do Renfrew.....	1905, July 3....	300 00	
Wright, E. A.	Warren	do District of Sudbury.....	1905, July 14...	500 00	
Whybourne, W. E...'	Marksville	do St. Joseph Island.....	1905, April 7...	250 00	
Watson, T. P.	Englehart	Homestead Inspector	1905, May 10...	912 50	
Woollings, J.	Englehart	Part of District of Nipissing.....	1908, June 30 ..	500 00	

D. GEO. ROSS
Accountant.

AUBREY WHITE,
Deputy Minister Lands and Forests.

Appendix No. 3.

Statement of Lands Sold and Leased. Amount of Sales and Leases and Amount of Collections for the year ending October 31st, 1910.

Service.	Acres sold and leased.	Amount of sales and leases.	Collection on sales and leases.
		$ c.	$ c.
Crown Lands:			
Agricultural	92,560.06	127,151 01	104,949 35
Mining	17,275.94	425,331 53	327,160 12
Clergy Lands	.....	.....	908 35
Common School Lands	20.50	70 95	8,486 59
Grammar School Lands	16.40	16 40	390 40
University Lands	4,019.95	2,109 35	1,072 08
Leases:			
Mining	9,028.86	10,249 39	29,008 79
Crown	4,782.77	1,571 00	7,469 66
	127,704.48	$566,499 63	$479,445 34

D. GEO. ROSS.
Accountant.

AUBREY WHITE,
Deputy Minister Lands and Forests.

Appendix No. 4.

Statement of Revenue of the Department of Lands, Forests and Mines for the year ending October 31st, 1910.

Service.	$ c.	$ c.	$ c.
LAND COLLECTIONS.			
Crown Lands:			
Agricultural	104,949 35		
Mining	327,160 12		
		432,109 47	
Clergy Lands	908 35		
Common School Lands	8,486 59		
Grammar School Lands	390 40		
University Lands	1,072 08		
		10,857 42	
Rent:			
Mining Leases	29,008 79		
Crown Leases	7,469 66		
		36,478 45	
Mining Licenses	84,059 49		
Recording Fees	109,622 99		
		193,682 48	
Royalties	246,529 13		
Provincial Mines	549 77		
		247,078 90	
Supplementary Revenue:			
Acreage Tax	15,394 14		
Profit Tax	120,687 54		
Gas Tax	7,127 91		
		143,209 59	
			1,063,416 31
WOODS AND FORESTS.			
Bonus		92,396 36	
Timber Dues		1,634,496 21	
Ground Rent		104,326 64	
Transfer Fees		3,863 50	
			1,835,082 71
Provincial Assay Fees	890 21		
Casual Fees	1,420 64		
Cullers' Fees	384 00		
		2,694 85	
Rondeau Park	5,256 00		
Algonquin Park	3,806 25		
Forest Reserves	930 50		
		9,992 75	
			12,687 60
REFUNDS.			
Bureau of Mines		4 00	
Wood Ranging		4,372 99	
Fire Ranging		29,553 80	
Diamond Drill		5,671 82	
Special Services and Unforeseen Expenses		21 00	
Agents' Salaries		390 00	
Explorations and Investigations		81 50	
Mining Recorders		5 00	
Exploration and Estimation of Timber Berths		67 20	
Special Surveys in Mining Districts		24 95	
Commissions *re* Sundry Investigations		49 70	
			40,241 96
			2,951,428 58

D. GEO. ROSS,
Accountant.

AUBREY WHITE,
Deputy Minister of Lands and Forests.

Appendix No. 5.

Statement of Receipts of the Department of Lands, Forests and Mines for the year ending October 31st, 1910, which are considered as Special Funds.

Service.	$ c.	$ c.
Clergy Lands.		
Principal	420 73	
Interest	487 62	
		908 35
Common School Lands.		
Principal	2,707 69	
Interest	5,778 90	
		8,486 59
Grammar School Lands.		
Principal	171 15	
Interest	219 25	
		390 40
University Lands.		
Principal	904 90	
Interest	167 18	
		1,072 08
		$10,857 42

D. GEO. ROSS,
Accountant.

AUBREY WHITE,
Deputy Minister of Lands and Forests.

Appendix No. 6.

Statement of Disbursements of the Department of Lands, Forests and Mines for the year ending October 31st, 1910.

Service.	$ c.	$ c	$ c.
AGENTS' SALARIES.			
Land.			
Baker, R. H.	350 00		
Both, Charles	100 00		
Brown, J. B.	900 00		
Buchanan, Thomas	300 00		
Byers, R. J.	500 00		
Campbell, J. G.	500 00		
Campbell, William	500 00		
Child, F. A.	500 00		
Eastland, T. G.	300 00		
Ellis, H. J.	500 00		
Freeborne, J. S.	500 00		
Grills, J. J.	500 00		
Hollands, C. J.	300 00		
Jenks, James	333 34		
Jenkin, William	500 00		
Small, R.	166 66		
Keefer, H. A.	500 00		
Lemieux, J. A.	400 00		
McFayden, Alex	500 00		
MacLennan, J. K.	500 00		
Parsons, J. W.	500 00		
Philion, J. A.	500 00		
Powell, F. R.	500 00		
Prince, Adam	500 00		
Pronger, R. H.	366 66		
Rothwell, B. J.	300 00		
Spry, W. L.	360 29		
Tait, J. R.	500 00		
Warren, D. B.	300 00		
Whybourne, W. E.	250 00		
Wilson, James	150 00		
Woollings, Joseph	500 00		
Wright, E. A.	500 00		
		13,876 95	
Timber.			
Christie, W. P.	1,600 00		
Hawkins, S. J.	1,400 00		
Henderson, Charles	1,600 00		
Howie, R. J.	1,100 00		
Johnson, S. M.	1,600 00		
McDonald, Hector	1,400 00		
McDougall, James T.	1,600 00		
Margach, William	1,600 00		
Maughan, Joseph	1,400 00		
Oliver, J. A.	1,500 00		
Stevenson, A.	1,400 00		
Watts, George	1,270 00		
MacDonald, S. C.	133 33		
		17,603 33	
Homestead Inspectors.			
Barr, James	1,200 00		
Burnes, C. W.	900 00		
Chester, Thomas	1,200 00		
Dean, Thomas	600 00		
Carried forward	3,900 00	31,480 28	

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	3,900 00	31,480 28	
AGENTS' SALARIES.—*Concluded.*			
Homestead Inspectors.—Concluded.			
Groulx, R. J.	600 00		
Hughes, Thomas	600 00		
Quenneville, I.	600 00		
Smith, James	228 00		
Watson, T. P.	912 50		
		6,840 50	
AGENTS' DISBURSEMENTS.			
Land.			
Baker, R. H.	4 08		
Brown, J. B.	143 15		
Buchanan, Thomas	11 00		
Byers, R. J.	18 58		
Campbell, J. G.	20 25		
Campbell, William	34 60		
Child, F. A.	26 40		
Freeborne, J. S.	10 40		
Grills, J. J.	18 49		
Jenkin, William	5 64		
Keefer, H. A.	60 95		
McFayden, A.	71 23		
Parsons, W. J.	11 75		
Philion, J. A.	10 74		
Powell, F. R.	14 00		
Prince, Adam	15 50		
Pronger, R. H.	30 15		
Spry, W. L.	609 80		
Warren, D. B.	2 50		
Woollings, Joseph	18 50		
		1,137 71	
Timber.			
Christie, W. P.	306 97		
Hawkins, S. J.	402 06		
Henderson, Charles	560 90		
Howie, R. J.	341 61		
Johnson, S. M.	210 40		
McDonald, Hector	361 60		
McDougall, J. T.	345 00		
Margach, William	2,273 26		
Maughan, J.	541 95		
Oliver, J. A.	1,360 33		
Stevenson, A.	592 12		
Watts, George	684 35		
		7,980 55	
Homestead Inspectors.			
Barr, James	440 55		
Burnes, C. W.	525 13		
Chester, Thomas	213 47		
Dean, Thomas	11 00		
Groulx, R. J.	197 75		
Hughes, Thomas	175 65		
Quenneville, I.	31 75		
Smith, James	240 50		
Watson, T. P.	314 20		
		2,150 00	
Carried forward		49,589 04	

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	49,589 04	
AGENTS' DISBURSEMENTS.—*Concluded.*			
Miscellaneous.			
Ames, D. H., Caretaker Islands in Dog and Loughborough Lakes	20 00		
Black, W. D., Inspection E. ½ 13 in 13, Sheffield	10 00		
Bilton, George, Caretaker of Islands in Mud and Loon Lakes	25 00		
Campbell, R. S., Inspection 4 in 10, Montague	8 00		
Davis, Samuel, Caretaker of Islands in Leonard Lake	20 00		
Guthrie, William, Caretaker of Islands in Devil's Lake	28 50		
Lee, J. B., Inspection of Gravel Pit	4 65		
Langworthy & McComber, Valuating Railway Reserve	25 00		
Marchildon, Thomas, Inspection of 17 and 18 in 20, Tiny	2 00		
Pyke, B. J., Inspection of lots in Warwick	49 25		
Sheppard, H. E., Inspection of Road Houses	10 50	202 90	
			49,791 94
OTTAWA.			
Darby, E. J., Agent	.....	1,500 00	
Larose, S. C., Clerk	.....	1,000 00	
Rent	375 00		
Disbursements	37 02	412 02	
			2,912 02
WOOD RANGING.			
Allen, R. A.	.....	1,550 00	
Ansley, J. J.	.....	1,260 00	
Ansley, W. E.	.....	850 00	
Arnill, William	.....	815 00	
Aylward, James	.....	750 00	
Barrett, Thomas	1,250 00		
Disbursements	54 45		
		1,304 45	
Bates, Robert	.....	424 00	
Baulk, G. R.	.....	304 00	
Berlinquet, Jules	.....	584 00	
Binnie, Thos.	.....	268 00	
Bliss, C. L.	.....	348 00	
Bliss, L. E.	780 00		
Disbursements	60 70		
		840 70	
Buie, D.	.....	85 00	
Buisson, William	.....	610 00	
Burd, J. H.	.....	80 00	
Burt, W.	.....	2 40	
Carter, George	.....	795 00	
Castonguay, A. C.	.....	950 00	
Charette, W. H.	.....	564 00	
Chenier, D. A.	.....	855 00	
Clark, D.	.....	240 00	
Comer, B. F.	.....	604 00	
Corrigan, R. T.	.....	1,185 00	
Coyne, P.	.....	875 00	
Daniels, R.	.....	402 50	
Dickie, D.	.....	440 00	
Carried forward	.....	16,986 05	52,703 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	16,986 05	52,703 96
WOOD RANGING.—*Continued.*			
Didier, H.	.....	695 00	
Doyle, T.	.....	205 00	
Doyle, William	.....	36 60	
Dougherty, G. M.	.....	165 00	
Dougherty, J. P.	.....	75 00	
Dupuis, A.	.....	196 00	
Durrell, William	.....	1,350 00	
Duval, C. A.	.....	395 00	
Ferguson, A. E.	.....	815 00	
Fisher, George	.....	725 00	
Fitzgerald, E. C.	785 00		
Disbursements	51 65		
		836 65	
Foster, E. G.	.....	502 88	
Fraser, W. A.	.....	1,120 00	
Gamey, W. H.	.....	705 00	
Gorman, J. P.	912 12		
Disbursements	60 25		
		972 37	
Greer, S. H.	.....	725 00	
Hart, J. I.	.....	700 00	
Hartley, C.	.....	1,180 00	
Hatch, J. W.	.....	120 00	
Henderson, C.	.....	10 29	
Huckson, A. H.	.....	1,160 00	
Humphreys, John	.....	396 00	
Hurdman, W. H.	.....	730 00	
Hutton, John	.....	725 00	
Irving, Ed.	.....	636 00	
Irwin, C. W.	.....	56 25	
Johnson, R. E.	.....	784 00	
Lee, J. B.	.....	775 00	
LeBrown, D.	.....	404 00	
Legris, John	.....	660 00	
Londry, W. E.	.....	405 38	
Long, H. E.	.....	710 00	
Macdonell, R. D.	.....	685 00	
McAuley, W. D.	.....	734 23	
McDonald, A. J.	1,236 00		
Disbursements	137 60		
		1,373 60	
McDonald, H.	.....	5 00	
McDonald, Thomas	.....	250 00	
McDonald, J. A., Estate	.....	151 65	
McCall, A.	.....	504 00	
McCaw, John	.....	1,475 00	
McGillivray, D. D.	.....	680 00	
McGregor, C. F.	.....	280 00	
McKenzie, R.	.....	488 00	
McLeod, W. A.	.....	815 00	
McNabb, Alex.	.....	905 00	
McNabb, A. D.	.....	261 54	
McPherson, J. S.	.....	1,170 00	
McWhinney, F. H.	.....	488 00	
Manice, W.	.....	1,300 00	
Margach, J. A.	.....	150 00	
Margach, William, Disbursements	.....	182 60	
Martin, E.	.....	810 00	
Carried forward	.....	48,666 09	52,703 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	48,666 09	52,703 96
WOOD RANGING.—*Continued.*			
Matheson, William	.....	500 00	
Menzies, Alex.	.....	1,160 00	
Miller, William	108 00		
Disbursements	3 20		
		111 20	
Milway, J. H.	.....	1,370 00	
Molyneaux, G.	.....	730 00	
Morley, Charles	.....	500 00	
Morley, F. W.	.....	132 00	
Mulroney, W. J. & G. 1909	.....	8 10	
Murray, William	1,410 00		
Disbursements	39 50		
		1,449 50	
Nash, John	.....	248 00	
Nevison, W. H.	.....	496 00	
Niblet, James	.....	1,025 00	
Oliver, J. A.	.....	7 58	
Paul, C. A.	.....	781 34	
Pigott, J. A.	.....	940 00	
Pender, D.	.....	730 00	
Porter, H.	86 00		
Disbursements	43 80		
		129 80	
Purdy, John	.....	590 00	
Revell, L. O.	.....	215 00	
Ridley, Robert	.....	830 00	
Rogers, F. W.	.....	85 00	
Rusk, Oscar	.....	1,065 00	
Scott, W. W.	.....	60 00	
Shaw, Alfred	.....	835 00	
Shields, F.	.....	400 00	
Shortt, James	.....	224 00	
Shouldice, John	111 00		
Disbursements	41 00		
		152 00	
Simmons, A. G.	.....	800 00	
Simpson, William	.....	685 00	
Smith, J. D. C.	945 00		
Disbursements	178 05		
		1,123 05	
Spearman, Thomas	.....	70 00	
Sproule, N.	.....	395 00	
Stuart, John	.....	360 00	
Strave, A. M.	.....	400 00	
Thompson, George S.	.....	905 00	
Thompson, W. B.	.....	335 00	
Thompson, I. E.	.....	105 76	
Tucker, L. A.	.....	356 00	
Urquhart, A	.....	970 00	
Vincent, H. T.	.....	1,305 00	
Wagner, F.	.....	610 00	
Ward, James	.....	365 00	
Watts, George, Disbursements	.....	8 80	
Webster, H. R.	.....	264 00	
Whelan, P. J.	.....	1,585 00	
White, A. T.	.....	265 00	
Wilkins, C. H.	.....	240 00	
Wilkins, G. N.	.....	690 00	
Carried forward	.....	75,278 22	52,703 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		75,278 22	52,703 96
WOOD RANGING.—*Concluded.*			
Wilson, F. G.		264 00	
Wood, W. D.		931 73	
Yuill, T.		1,030 00	
			77,503 95
EXPLORATION AND ESTIMATION OF TIMBER BERTHS.			
Burns, William, Disbursements		14 40	
Fraser, Duncan		200 00	
Kennedy, W. C.	308 00		
Disbursements	160 61		
		468 61	
McCreight, John		594 45	
Margach, William		513 18	
Henderson, Charles	250 00		
Disbursements	921 75		
		1,171 75	
Thompson, W. B.	570 00		
Disbursements	75 45		
		645 45	
Taylor, John		25 40	
			3,633 24
ESTIMATING TEMAGAMI RESERVE.			
Kennedy, W. C.		378 00	
Disbursements		174 76	
			552 76
FIRE RANGING.			
Acton, M. M.	300 00		
Disbursements	1 50		
		301 50	
Adam, Alex.		427 50	
Adams, Arthur 1909		131 00	
Alison, M. B.		422 50	
Ambrose, A. W. 1909		131 00	
Anderson, Frank 1909		131 00	
Anger, Leon		387 00	
Anglin, G. E.		335 00	
Archambault, G.		285 00	
Archer, John 1909		36 00	
Archer, George 1909		76 00	
Armstrong, D. J.	77 50		
Disbursements	30 50		
		108 00	
Armstrong, T. C.		395 00	
Arnott, George 1909		87 00	
Aubin, George 1909		105 00	
Baker, Ben. 1909	126 00		
Disbursements	4 00		
		130 00	
Baker, Herbert		382 50	
Baird, James McC.		287 50	
Baird, S.		62 00	
Barrett and Sargeant		9 00	
Barry, H.		280 00	
Bates, R.		277 50	
Baumann, Theo. 1909		125 00	
Carried forward		4,912 00	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	4,912 00	134,393 91
FIRE RANGING.—*Continued.*			
Beys, Morgan	.....	405 00	
Beaton, W. H. 1909	.....	131 00	
Beaudry, John 1909	.....	131 00	
Belanger, E.	.....	297 50	
Bell, Thomas 1909	.....	82 00	
Bellow, Louis 1909	.....	131 00	
Benhome, Louis 1909	.....	79 00	
Bentham, William	.....	412 50	
Bernard, Michael 1909	.....	77 00	
Binnette, J.	.....	44 00	
Bird, John 1909	.....	131 00	
Birmingham, E. A.	90 00		
Disbursements	25 95		
		115 95	
Bisaillon, J.	415 00		
Disbursements	152 61		
		567 61	
Bisaillon, J. H.	1,285 00		
Disbursements	57 40		
		1,342 40	
Bliss, L. E.	1,141 55		
Disbursements	513 59		
		1,655 14	
Brasher, S. M.	.....	397 50	
Brazeau, O.	.....	382 50	
Breadon, H. M.	.....	320 00	
Brenchley, J.	.....	29 15	
Brignall, W. M.	.....	280 00	
Brown, Ed.	.....	65 00	
Brown, Henry 1909	.....	131 00	
Brown, Thomas	.....	387 50	
Brown, T. E.	.....	382 50	
Bruce, George	.....	425 00	
Brunet, Alphonse	.....	402 50	
Brogden, Lawrence	.....	45 00	
Buchanan, Robt. F.	.....	382 50	
Burns, Gordon	.....	327 50	
Boivin, Joseph	.....	270 00	
Boldt, A.	.....	432 50	
Bookout, H.	.....	380 00	
Booth, Robert 1909	.....	24 50	
Booth, J. R. 1909	.....	2 00	
Borron, Arthur 1909	.....	109 50	
Bouchard, Nicholas	.....	412 50	
Boucher, Joseph 1909	.....	131 00	
Bourgard, Adolphe 1909	.....	132 00	
Bouchey, Arthur 1909	.....	97 00	
Boyd, John 1909	.....	83 00	
Boyd Lumber Co. 1909	.....	88	
Boynton, John 1909	.....	124 00	
Brannan, W. H. 1909	.....	87 00	
Burns, Walter	.....	485 60	
Burron, E. M. 1909	.....	131 00	
Bythell, J. R.	.....	375 00	
Cahill, James	.....	257 50	
Cairns, B.	.....	125 00	
Campbell, Duncan	.....	400 00	
Campbell, Fred.	.....	320 00	
Carried forward	.....	18,851 73	134,393 91

Appendix No. 6.—Continued.

Service.		$ c.	$ c.	$ c.
Brought forward			18,851 73	134,393 91
FIRE RANGING.—*Continued.*				
Campbell, Henderson	1909		130 00	
Campbell, Walter			377 50	
Campbell, J. L.		430 00		
Disbursements		122 36		
			552 36	
Canning, James	1909		75 00	
Carey, James	1909		92 00	
Carnochan, Gordon			402 50	
Carpenter, Joe			122 00	
Carruthers, R.			375 00	
Carson, G. M.			355 00	
Cassidy, James			394 00	
Cassidy, Michael	1909		22 00	
Cayen, Baptiste			375 00	
Chambers, J. K.			405 00	
Chambers, Thomas			402 50	
Chapman, C. N.			285 00	
Charron, Joseph	1909		131 00	
Chatson, Fred.	1909		131 00	
Cheeseman, William	1909		111 00	
Chenier, Emile			380 00	
Chenier, D. A.			413 00	
Chittick, W. J.		522 50		
Disbursements		22 85		
			545 35	
Chretien, Napoleon			222 50	
Cole, J. J.			380 00	
Collins, Charles	1909		131 00	
Colloton, R. B.	1909		70 00	
Connelly, Daniel	1909		30 00	
Connolly, Harold			397 50	
Conture, N.	1909		102 00	
Cornett, F. W.			345 00	
Cote, C. A. E.	1909		131 00	
Couch, Wellington			75 00	
Coulter, Charles			380 00	
Cousineau, A.			415 00	
Coyne, Phin.		644 00		
Disbursements		14 85		
			658 85	
Cross, Jule			387 50	
Culhane, Dan.	1909		109 00	
Cullen, M. T.	1909		131 00	
Currie, John C.	1909		131 00	
Cunningham, W. A.			225 00	
Cuyler, W.			247 50	
Dagan, John			97 50	
Daley, John	1909		88 00	
Daniels, Ralph			672 00	
Darling, Thomas, & Son	1909		158 63	
Davie, George			402 50	
Dedine, Joel			392 50	
Degagne, C.			340 00	
Demeras, J.			92 00	
Dennison, H. J.	1909		131 00	
Deschaine, Antoine			407 50	
D'Eye, Henry	1909		23 27	
Dickinson, Thomas			177 50	
Carried forward			32,479 19	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		32,479 19	134,393 91
FIRE RANGING.—*Continued.*			
Didier, Hector 1909		52 00	
Dillabough, Jacob 1909		37 00	
Dixon, John H.		300 00	
Dobie, Alex. R. 1909		72 00	
Donald, Robert		405 00	
Dougherty, A. E.		415 00	
Doyle. John 1909		111 00	
Doyle, T. J. 1909		131 00	
Draycott, E. A. 1909		65 00	
Draycott, F. W. 1909		106 00	
Duff, J. M.		312 50	
Dugan, J. K.		400 00	
Duncan, E. J. 1909		131 00	
Durnin, E. W.		327 50	
Dyson, W.		380 00	
Eady, Robert S. 1909		88 00	
Eady, Peter 1909		61 00	
East, W. J.		390 00	
Ebert, John 1909		72 00	
Eddy Bros. & Co. 1909		40 00	
Eilber, George		397 50	
Elliott, Jackson		405 00	
English, John		395 00	
Ethier, Wilfred 1909		58 00	
Ethier, Augustin 1909		16 00	
Evans, Ed.		300 00	
Faulkner, Jacob 1909		90 00	
Favreau, George 1909		131 00	
Ferguson, William		432 50	
Ferguson, George		412 50	
Fisher, George		568 00	
Fitzhenry, John 1909		131 00	
Flynn, Frank 1909		130 00	
Foley, Welch and Stewart 1909		35 83	
Forsyth, O. G.		285 00	
Fox, James		345 00	
Fraser, Donald		397 50	
Fraser, William		247 00	
Gagne, F.	915 50		
Disbursements	67 28		
		982 78	
Gagnon, Felix, ...1909		132 00	
Gale, W. G.		402 50	
Gardiner, John 1909		131 00	
Gavin, Henry 1909		86 00	
Gemmill, John		200 00	
Georgian Bay Lumber Co. 1909		67 00	
Gill, William		380 00	
Glandon, Napoleon 1909		131 00	
Godin, Moise 1909		79 00	
Gongeon, Arsene 1909		131 00	
Golden Lake Lumber Co. 1909		25 00	
Gordon, George, & Co. 1909		692 68	
Gordon, H. V.		335 00	
Gordon, Thomas		307 50	
Gordon, W. M.		200 00	
Gorman, M. D. 1909		131 00	
Granton, James		367 50	
Carried forward		45,932 98	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		45,932 98	134,393 91
FIRE RANGING.—*Continued.*			
Graves, Frank 1909		69 00	
Graves, Bigwood & Co. 1909		1 50	
Grawberger, Thomas 1909		134 00	
Gray, E. E.		370 00	
Green, John 1909		90 00	
Griffin, James 1909		111 00	
Guertin, Oliver 1909		131 00	
Guthrie, William		432 50	
Hall, Thomas		432 50	
Hamilton, Robert		337 50	
Hand, Thomas		500 00	
Hardy, Frank		470 00	
Harrison, Arthur		345 00	
Hawley, James 1909		105 00	
Hayden, George F.		402 50	
Hebert, Louis		360 00	
Henderson, C. E.	215 00		
Disbursements	94 00		
		309 00	
Henderson, John 1909		124 00	
Herringer, W. J.		375 00	
Hervieux, Joseph 1909		79 00	
Hickey, James L. 1909		122 00	
Hicks, Stewart 1909		96 00	
Higgins, Douglas G.		400 00	
Higley, C. E.		270 00	
Hodder, Leslie		285 00	
Hodge, William Ray		265 00	
Hornick, George		457 50	
Howett, John		300 00	
Hughes, Gordon		332 50	
Hughes, William 1909		89 00	
Humphrey, W.		205 00	
Hurd, A. 1909		22 00	
Hurtubise, Augustine		386 50	
Husband, A. C.		307 50	
Hutton, Harold L.		312 50	
Irish, William		382 50	
Jamieson, Kenneth		390 00	
Jarvis, H. R.		382 50	
Jeffrey, William		380 00	
Jenks, Charles		325 00	
Johncox, Stephen 1909		122 00	
Johnson, George N.		392 50	
Johnson, Thomas 1909		98 00	
Jones, Robert		327 50	
Jordan, William		365 00	
Judge, Selwyn E.		265 00	
Jury, J. C.		397 50	
Kelly, William 1909		105 00	
Kennedy, Claude		402 50	
Kerr, Oliver 1909		131 00	
Kiely, Michael		417 50	
Kirkpatrick, Peter		212 50	
Kingsley, Ferdinand		397 50	
Kohl, A.		317 50	
Kruger, August		392 50	
Labelle, Adolphe		425 00	
Carried forward		61,590 48	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		61,590 48	134,393 91
FIRE RANGING.—*Continued.*			
Labine, Emile 1909		90 00	
Lafleur, William 1909		131 00	
Lalonde, E.		170 00	
Lambert, Henry 1909		21 00	
Lampson, Lyman		397 50	
Langevin, Joseph 1909		139 00	
Langley, E.		85 00	
Langdon, Herbey		397 50	
Larkins, Edward 1909		131 00	
Lawson, David 1909		104 00	
Laurien, C.		380 00	
Laurien, J.		380 00	
Lavoie, Ben. 1909		131 00	
Leach, W. J.		315 00	
Lee, James B.	949 25		
Disbursements	184 34		
		1,133 59	
Legris, John	725 00		
Disbursements	240 59		
		965 59	
Lennox, Thomas A.		315 00	
Lentz, W. H. 1909		62 00	
Little, Peter 1909		131 00	
Locheed, Ralph		390 00	
Logneed, R. J.		397 50	
Loiselle, Peter		415 00	
Long, H. E.	472 00		
Disbursements	53 40		
		525 40	
Lower, A.		325 00	
Lunam, Thomas E. 1909		105 00	
Lunan, William		397 50	
Luton, R. M.		337 50	
Lyle, J.		114 00	
Lyttle, John C.		220 00	
McAvoy, Michael 1909		69 00	
McCagherty, J. P. 1909		101 00	
McCallum, Frank 1909		77 00	
McCann, Philip 1909		131 00	
McConnell, Eric 1909		91 00	
McCormack, R.		337 50	
McCullough, C.		397 50	
McCullough, D. J.		440 00	
McDermott, T. J.		132 00	
McDermott, W. B.		350 00	
McDonald, Charles		400 00	
McDonald, Joseph		202 50	
McDonald, Joe		225 00	
McDonald, James A. 1909		15 00	
McDonald, Roderick 1909		123 00	
McDougall, J. T., Disbursements		62 19	
McFadden, Ed. 1909		131 00	
McFaul, Lawrence		325 00	
McGhie, Charles 1909		131 00	
McGown, Thomas 1909		123 00	
McGregor, Thomas 1909		73 00	
McIntyre, J. E. 1909		98 00	
Carried forward		74,331 25	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	74,331 25	134,393 91
FIRE RANGING.—*Continued.*			
McKenzie, Robert	395 00		
Disbursements	122 87		
		517 87	
McKim, Robert	.....	112 00	
McKinnon, H.	.....	392 50	
McLaren, W. E.	.....	410 00	
McLaughlin, John S. 1909	80 00		
Disbursements	25 10		
		105 10	
McLeod, Angus 1909	.....	91 00	
McLeod, John 1909	.....	79 00	
McLean, Clarence	.....	127 50	
McLean, Malcolm	.....	360 00	
McMillan, Ainslie 1909	.....	124 00	
McMurray, James	.....	362 50	
McNally, Andrew	.....	117 50	
McNulty, George	.....	365 00	
McPhee, Hugh 1909	.....	131 00	
McRae, Duncan	.....	461 00	
McRae, J. D. 1909	.....	171 75	
Macavoy, Patrick	.....	312 50	
MacDonald, J. D.	.....	143 00	
MacDonell, R. D.	.....	560 00	
MacGillivray, E. F.	.....	222 00	
MacNeil, E. R.	.....	387 50	
Maguire, T. C.	.....	357 50	
Mallory, George 1909	.....	24 00	
Malone, Gerald M.	.....	262 50	
Maltby, William 1909	.....	6 00	
Manes, John 1909	.....	105 00	
Manes, Edward F. 1909	.....	105 00	
Margach, William, Disbursements	.....	124 50	
Marks, W. 1909	.....	54 00	
Marston, William	.....	402 50	
Martin, M., ...1909	.....	128 00	
Matte, Joseph	.....	437 50	
Mayer, O. A	.....	222 50	
Menard, Napoleon	.....	380 00	
Mickle, Dyment & Son	.....	36 00	
Millichamp, T. A.	736 00		
Disbursements	105 92		
		841 92	
Miller, R. R.	.....	405 00	
Miller, A.	.....	335 00	
Mills, Robert 1909	.....	82 00	
Milway, J. H.	.....	65 00	
Mole, Herman	.....	320 00	
Mongeon, Alex. 1909	.....	131 00	
Montreuil, Louis 1909	.....	123 00	
Moriarity, Michael 1909	.....	131 00	
Moore, B. F.	.....	382 50	
Moore, James	.....	287 50	
Morand, Louis	.....	415 00	
Mosley, Edward 1909	.....	124 00	
Mowat, James 1909	.....	107 00	
Murphy, Charles 1909	.....	127 00	
Nadon, Damase	.....	387 00	
Neely, A. H.	.....	357 50	
Carried forward	.....	87,150 39	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	87,150 39	134,393 91
FIRE RANGING.—*Continued.*			
Newman, R. J. 1909	.....	92 00	
Newburn, William	.....	400 00	
Noiseau, F. 1909	.....	134 00	
Noonan, John 1909	.....	69 00	
Nundy, George	.....	390 00	
O'Brien, M. 1909	.....	146 00	
O'Connor, Lawrence	127 50		
Disbursements	19 35		
		146 85	
Odjick, William 1909	.....	86 00	
O'Malley, David	.....	397 50	
O'Neil, Samuel 1909	.....	110 00	
Oliver, J. A.	.....	1,269 51	
Onegut, Joseph	.....	467 50	
Orr, William 1909	.....	43 00	
Oswald, Thomas 1909	.....	91 00	
Ouelette, Frank	.....	430 00	
Page, George 1909	.....	131 00	
Paisley, Lorenzo 1909	.....	131 00	
Paquette, O. 1909	.....	131 00	
Parcher, Cyrus 1909	.....	25 00	
Parker, William 1909	.....	131 00	
Patterson, Bryson C.	.....	400 00	
Peloquin, Norbert	.....	375 00	
Pelot, John 1909	.....	130 00	
Pembroke Lumber Co. 1909	.....	3 00	
Phead, Dennis	.....	170 00	
Pigeon, Charles	.....	445 00	
Pilon, Xavier	.....	390 00	
Pingle, Alex.	.....	407 50	
Piskey, D. 1909	.....	50 00	
Plourde, Charles 1909	.....	43 00	
Poulin, Noe	.....	327 50	
Poulin, William	.....	318 75	
Powell, John, Jr.	.....	142 50	
Prevost, David	.....	380 00	
Price, Percy	.....	400 00	
Pronger, J. F.	.....	205 00	
Proulx, A.	.....	247 50	
Quesnel, Fred.	.....	415 00	
Quilty, J. J.	.....	417 50	
Raycott, Thomas 1909	.....	131 00	
Reynolds, Harry	.....	232 50	
Reynolds, Napoleon	.....	390 47	
Reynolds, Norman	.....	395 00	
Richardson, E. A.	.....	335 00	
Richardson, Sylvester	.....	370 00	
Ringle, Hugh	.....	154 00	
Robertson, Bruce	.....	312 50	
Robinson, H. P.	.....	322 50	
Rochford, Adolph	.....	430 00	
Rockall, F. W.	.....	387 50	
Rodden, M. J.	.....	325 00	
Rodgers, Walter	.....	405 00	
Rose, George 1909	.....	131 00	
Ross, H. E.	.....	300 00	
Ryan, John E. 1909	.....	130 00	
Ryan, Patrick 1909	.....	120 00	
Carried forward	.....	102,110 47	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		102,110 47	134,393 91
FIRE RANGING.—*Continued.*			
Ryan, William H. 1909		95 00	
Sandow, Peter 1909		131 00	
Savard, August		370 00	
Schiller, James G.		322 50	
Scott, Robert		600 00	
Scott, R. R.		290 00	
Servage, Grant		382 50	
Shannon, R. M. 1909		131 00	
Sharp & Jackson 1909		127 63	
Sheppard & Wallace 1909		58 00	
Shepard & Morse Lumber Co. 1909		212 00	
Sheppard Lumber Co. 1909		108 00	
Sherwood & Russel 1909		200 00	
Shier, J. D., Lumber Co. 1909		158 00	
Shives, R. D.		134 00	
Shouldice, John 1909		32 00	
Simpson, A.		200 00	
Simpson, Theodore 1909		27 00	
Simpson, William		362 50	
Sinclair, D. G.		320 00	
Singleton, A.		50 00	
Skinner, W. P.		72 00	
St. Laurent, Joseph 1909		131 00	
Sleemin, Dufferin		312 50	
Smeltzer, J. H.		335 00	
Smith, A. L.		380 00	
Smith, Hilliard 1909		79 00	
Smith, Joseph 1909		131 00	
Smith, Nelson		380 00	
Smith, Rex		335 00	
Smyth, P. J.		362 50	
Snetzinger, H. A.		325 00	
Solomon, John 1909		112 00	
Somers, Joseph W. 1909		131 00	
Soubliere, Leon		397 50	
Spanish River Lumber Co. 1909		132 50	
Spearing, Fred.		327 50	
Spears, Henry 1909		60 00	
Spence, William, Jr.		415 00	
Spence, W. H. 1909		131 00	
Spillette, A.		412 50	
Spillette, J. J.		412 50	
Spreadborough, N. 1909		178 75	
Spreadborough, G. 1909		132 00	
Steep, Frederick 1909		82 00	
Stevenson, Alex.		405 00	
Stevenson, Lionel		382 50	
Stevenson, William 1909		20 85	
Sullivan, John, Sr.		392 50	
Sullivan, John, Jr.		300 00	
Suter, F. J.		340 00	
Swinston, Charles		400 00	
Symington, William 1909		131 00	
Tang, John 1909		42 25	
Tapp, Thomas 1909		55 00	
Tapping, Thomas		2 00	
Taylor, Charles N. 1909		131 00	
Taylor, William J. 1909		132 00	
Carried forward		114,922 95	134,393 91

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		114,922 95	134,393 91
FIRE RANGING.—*Concluded.*			
Thessalon Lumber Co. 1909		77 01	
Thibert, Philip		417 50	
Thompson, Chris 1909		128 00	
Thompson, Robert 1909		82 00	
Thompson, George S.		450 00	
Thomson, John		267 50	
Thomson, R. D. 1909		131 00	
Timmony, Edward 1909		131 00	
Tinsley, H.		280 00	
Travis, Thomas		360 00	
Tremblay, Alfred		400 00	
Tremblay, J. F.		402 50	
Treton, Frank		380 00	
Tunstell, George		302 50	
Tyson, William 1909		114 00	
Urquhart, A.		560 00	
Urquhart, John 1909		35 00	
Vaillancourt, Donald		392 50	
Vermette, John 1909		107 00	
Viverais, M.		430 00	
Wagner, H. W.	157 50		
Disbursements	27 45		
		184 95	
Walker, James 1909		32 00	
Wallberg, E. A. 1909		406 48	
Wallace, Arthur J.		227 50	
Walton, Bruce		380 00	
Ward, James		377 50	
Watts, George		224 59	
Waugh, Keith		400 00	
Weir, George 1909		32 10	
Wendt-Wreidt, A. J. F.		402 50	
Wickens, H.		317 50	
Williams, Gordon 1909		105 00	
Williams, L. E.		237 50	
Williams, William		111 37	
Williamson, Hugh		290 00	
Willoughby, J. B.		390 00	
Wilkes, G. H.		390 00	
Wilkins, G. N.		568 00	
Winn, Joseph		467 50	
Wisseau, M.		172 50	
Wodehouse, R. P.		300 00	
Woodcock, George	532 50		
Disbursements	32 45		
		564 95	
Wright, Colin 1909		156 65	
Wright, H. H.		392 50	
Wright, John S.		407 50	
Yearly, Fred. 1909		131 00	
Yeats, Henry F. 1909		110 00	
Youmans, D. E. 1909		84 00	
Young, Robert		400 00	
			128,634 05
Carried forward			263,027 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward			263,027 96
FOREST RESERVES.			
Temagami Reserve—$46,397.95.			
Allan, D.		392 50	
Allan, W. N.		365 00	
Ashall, E. R.		370 00	
Aubut, William		392 50	
Barr, James		375 00	
Barrett, Thomas	765 00		
Disbursements	353 37		
		1,118 37	
Beibet, August		242 50	
Bessette, E.		390 00	
Boland, A.		97 50	
Bond, St. George		90 00	
Bonter, E. R.		382 50	
Brennan, P.		255 00	
Brazeau, Z.		380 00	
Brazeau, J.		362 50	
Broughton, P.		370 00	
Bruce, T. L.		322 50	
Buisson, William	142 50		
Disbursements	7 90		
		150 40	
Burrows, T. L.		192 50	
Bushfield, N. A.		387 50	
Butcher, J. C.		390 00	
Butler, F. B.		392 50	
Cameron, William		14 60	
Cavan, W. E.		350 00	
Clement, F. W.		377 50	
Cline, G.		35 00	
Coatsworth, W. B.		380 00	
Coombes, W.		370 00	
Derosier, John		387 50	
Duval, C. A.		350 00	
Faries, R.		1,356 00	
Fennell, T. H.		16 45	
Finlay, J. R.		322 50	
Fortin, J.		277 50	
Frenette, Sam		322 50	
Garnham, W. H.		370 00	
Grenier, James		362 50	
Hagerman, G.		387 50	
Hamilton, G. M.		380 00	
Hanington, A. E.		300 00	
Harkness, A. E.		160 00	
Harrison, J. W.		392 50	
Heenan, Patrick		567 50	
Henderson, Charles		25 23	
Higgins, L. T.		387 50	
Heraux, J.		167 50	
Hindson, C.		124 66	
Hutchinson, J. A. 1909	172 50		
Disbursements	12 05		
		184 55	
James, C.		32 50	
James, John		267 50	
Jocko, John		227 50	
Carried forward		16,315 26	263,027 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		16,315 26	263,027 96
FOREST RESERVES.—*Continued.*			
Temagami Reserve.—Continued.			
Jones, N. L.		12 50	
Keenan, J. T.		390 00	
Kelso, R. F.		365 00	
Kennear, John		170 00	
Knox, E.		350 00	
Lamarche, A.		920 00	
Lamarche, C.		332 50	
Latoure, J.		392 50	
Le Blanc, A.		305 00	
Le Blanc, O.		437 50	
Leggett, R. P.		385 00	
Levigne, L.		182 50	
Livingstone, H.		260 00	
Lumb, W. E.		390 00	
Lytle, L. B.		342 50	
McCammon, J. G. 1909	40 00		
Disbursements	24 70		
		64 70	
McDonald, C. 1909		182 50	
McDonald, G. G.		385 00	
McDougal, D.		370 00	
McGregor, P.	860 00		
Disbursements	14 45		
		874 45	
McIlmoyle, W.		345 00	
McKenzie, C. H.		375 00	
McKenzie, W. L.		300 00	
McMenemy, G.		385 00	
McNaughton, F. D.	822 00		
Disbursements	141 24		
		963 24	
McNeil, E. H.		380 00	
McPhee, D.		357 50	
MacDonald, S. C.	1,191 00		
Disbursements	827 80		
		2,018 80	
Manning, V.		82 50	
Mattchett, L. L.		380 00	
Matthews, H. E.		307 50	
Merchant, H.		372 50	
Mickleborough, C.		120 00	
Mills, P.		360 00	
Montgomery, Alex.	552 50		
Disbursements	19 00		
		571 50	
Morrow, F.		85 00	
Mundle, F.		380 00	
Nadon, P.		187 50	
Neil, W. E.		380 00	
Nicolet, F.		390 00	
Nichols, H.		352 50	
O'Connor, J.		165 00	
O'Neil, W.		377 50	
Palmer, C. E.		362 50	
Petrant, W.		390 00	
Phillips, R. A.		382 50	
Carried forward		34,197 95	263,027 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		34,197 95	263,027 96
FOREST RESERVES.—*Continued.*			
Temagami Reserve.—Concluded.			
Potvin, E.		330 00	
Prudhomme, A.		387 50	
Purvis, H.		390 00	
Ranger, A.		362 50	
Ranger, P.		380 00	
Raymond, A.		367 50	
Reesor, G.		380 00	
Renton, T. H.		377 50	
Reynolds, G.		87 50	
Roadhouse, L.		195 00	
Roadhouse, M.		125 00	
Roche, H.		225 00	
Rochon, F.		237 50	
Rochon, J.		920 00	
Thompson, A. H.		302 50	
Trimble, H. J.		352 50	
Turner, J.		390 00	
Tutt, W. R.		350 00	
Tytler, N. D.		322 50	
Vair, M. G.		370 00	
Valois, P.		180 00	
Valois, S.		362 50	
Vivaris, D.		1,120 00	
Wanser, E. J.		380 00	
Watts, E. M.		370 00	
White, T.		312 50	
Sanders, N. M.		27 50	
Scott, F. R.		280 00	
Stewart, William		150 00	
Stuart, J. E.		375 00	
Stuart, J. A.		387 50	
Shelson, H.		270 00	
Sleeth, B.		387 50	
Smyth, P. J.		25 00	
Sweeney, D.		342 50	
Swift, R. R.		377 50	
Metagami Reserve—$6,578.55.			
Blais, Odilore		382 50	
Burden, John	668 00		
Disbursements	155 70		
		823 70	
Chambers, E. V.		385 00	
Culp, J. S.		387 50	
Eveline, A.		407 50	
Farley, J. T.		382 50	
Howard, R. H.	87 50		
Disbursements	7 35		
		94 85	
Kitt, A. N.		347 50	
Leadbetter, W. R.		360 00	
Leatherdale, W. B.		385 00	
Macauley, A. T.		385 00	
Morand, R. D.		385 00	
Morley, Warren		140 00	
Carried forward		51,264 00	263,027 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		51,264 00	263,027 96
FOREST RESERVES.—*Continued.*			
Metagami Reserve.—Concluded.			
Poisson, A. L.		390 00	
Saunders, C. E.		385 00	
Thurston, A. M.		385 00	
Wallace, J. B.		287 50	
Washburn, B. L.		265 00	
Mississaga Reserve—$9,204.78.			
Albright, L.		425 00	
Bickell, R. B.		380 00	
Body, W. J.		382 50	
Copman, C. C.		377 50	
Curtis, G. S.		360 00	
Davidson, W. M.		377 50	
Dean, T. N.		327 50	
Dewar, E. H.		360 00	
Dobbin, G. M.		382 50	
Dobson, H. E.		287 50	
Easton, L.		387 50	
Gorsline, R.		350 00	
Graham, James H. ..... Disbursements		2 70	
Greer, J.		382 50	
Holmes, A. B.		380 00	
Houser, F. B.		230 00	
Kinney, William	975 00		
Disbursements	329 58		
		1,304 58	
Morgan, J. P.		375 00	
Mutchmore, J. R.		347 50	
Porte, A. H.		42 50	
Reid, Byron		355 00	
Seeley, S.		402 50	
Smith, R. M.		312 50	
Wheeler, Alex.		367 50	
White, G. E.		305 00	
Nepigon Reserve—$7,831.77.			
Anger, Alex		340 00	
Bliss, L. E. ..... Disbursements		133 68	
Bothwell, George E.		335 00	
Bouchard, Joseph		335 00	
Cook, Kenneth E.		335 00	
Cook, Lorne H.		307 50	
Day, Oswald		307 50	
De La Ronde, Charles		335 00	
Ernest, F. E.		315 00	
Grant, George		27 50	
Hiscocks, H. G.		297 50	
Johnston, N. F.		322 50	
Leitch, P. A.	750 00		
Disbursements	233 09		
		983 09	
Lock, Russell		330 00	
Lucas, Fred		345 00	
MacGillivray, Roy		37 50	
Carried forward		67,268 05	263,027 96

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		67,268 05	263,027 96
FOREST RESERVES.—*Concluded.*			
Nepigon Reserve.—Concluded.			
Montgomery, R. L.		370 00	
Ritchie, W.		365 00	
Scott, N.		365 00	
Servais, Albert J.	510 00		
Disbursements	10 00		
		520 00	
Shipman, George W.		287 50	
Simmons, R. L.	540 00		
Disbursements	10 00		
		550 00	
Wagner, H. W.		287 50	
Eastern Reserve—$1,491.25.			
Bishop, H.		355 00	
Gilmour, John		355 00	
Tapping, Thomas	400 00		
Disbursements	26 25		
		426 25	
Watkins, R.		355 00	
Sibley Reserve—$100.00.			
Oliver, J. A.		100 00	
Quetico Reserve—$6,641.00.			
Adams, W. J.		165 00	
Breckon, Fred		195 00	
Bury, H. J.		357 50	
Campbell, J. S.		360 00	
Crawford, E. J.		360 00	
Darly, W.		360 00	
Darlington, E.		352 50	
Hampshire, Fred		360 00	
Henry, Alex.		360 00	
Jonhston, R.		360 00	
McDonald, J.		322 50	
Martin, W. A.		360 00	
Readman, R.		576 00	
Sanderson, A. J. K.		352 50	
Scholes, W.		360 00	
Strain, J.		360 00	
Sutton, George		360 00	
Tripp, E. C.		360 00	
Wall, George		360 00	
			78,245 30
MINES AND MINING.			
Miller, G. W., Provincial Geologist, services	4,250 00		
Disbursements	999 48		
		5,249 48	
Mickle, G. R., Mine Assessor, services	4,000 00		
Disbursements	745 50		
		4,745 50	
Carried forward		9,994 98	341,273 26

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	9,994 98	341,273 26
MINES AND MINING.—*Concluded.*			
Price, S., Mining Commissioner, services	3,200 00		
Dance, R. W., services	865 00		
Disbursements	1,426 15		
		5,491 15	
Corkill, E. T., Inspector of Mines, services	2,150 00		
Disbursements	1,408 54		
		3,558 54	
Knight, C. W., Assistant Geologist, services	1,900 00		
Disbursements	351 13		
		2,251 13	
			21,295 80
EXPLORATIONS AND INVESTIGATIONS.			
Baker, M. B.	675 00		
Disbursements	1,168 40		
		1,843 40	
Bartlett, James	692 92		
Disbursements	45 80		
		738 72	
Bowen, N. L.	471 16		
Disbursements	704 90		
		1,176 06	
Burrows, A. G.	1,743 00		
Disbursements	2,685 64		
		4,428 64	
Moore, E. S.	455 77		
Disbursements	1,439 37		
		1,895 14	
Parsons, A. L.	519 23		
Disbursements	970 45		
		1,489 68	
Robinson, A. H. A.	2,000 00		
Disbursements	499 57		
		2,499 57	
Rogers, W. R.	1,317 28		
Disbursements	449 26		
		1,766 54	
Scott, John	600 00		
Disbursements	284 45		
		884 45	
Sharpe, Donald	550 00		
Disbursements	233 15		
		783 15	
Toyne, John	50 00		
Disbursements	22 65		
		72 65	
Express	.....	55	
			17,578 55
SPECIAL SERVICES AND UNFORESEEN EXPENSES			
McNeill, W. K.	.....	411 62	
Disbursements *re* Toronto Exhibition	.....	681 63	
			1,093 25
SPECIAL SURVEYS IN MINING DISTRICTS	.....	.....	814 57
EXPERIMENTAL TREATMENT OF ORE	.....	.....	5,313 81
Carried forward	.....	.....	387,369 24

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward	.....	.....	387,369 24
MINING RECORDERS.			
Bowker, S. T., Recorder	889 75		
Disbursements	303 79		
		1,193 54	
Bruce, A. E. D., Recorder	900 00		
Blair, F. J., Clerk	453 46		
Graham, F. W., Clerk	631 14		
Gray, J. B., Clerk	605 76		
Disbursements	2,987 21		
		5,577 57	
Campbell, C. A., Recorder	779 92		
Washburn, H., Clerk	508 86		
Yonge, E., Clerk	382 12		
Disbursements	251 75		
Lemieux, F. F., Recorder	124 00		
Disbursements	205 66		
		2,252 31	
Hough, J. A., Recorder	1,200 00		
Browning, A. J., Clerk	900 00		
Disbursements	75 45		
		2,175 45	
McArthur, T. A., Recorder	1,200 00		
McLaren, Kate, Stenographer	480 00		
Disbursements	490 86		
		2,170 86	
McQuire, H. F., Recorder	500 00		
Disbursements	182 40		
		682 40	
Morgan, J. W., Recorder	846 38		
Disbursements	311 15		
		1,157 53	
Sheppard, H. E., Recorder	1,000 00		
Gordon, T. C., Clerk	1,080 00		
Glazier, M. B., Clerk	450 00		
Keenan, H. F., Clerk	899 99		
Disbursements	1,458 00		
		4,887 99	
Skill, A., Recorder	1,200 00		
Adams, W. G., Clerk	597 69		
Glazier, M. B., Clerk	626 54		
Disbursements	367 58		
		2,791 81	
Smith, G. T., Recorder	2,200 00		
McAuley, N. J., Clerk	300 00		
Bruce, A. E. D., Clerk	300 00		
Ferguson, R. H., Clerk	495 00		
Meagher, T. J., Clerk	888 50		
Sarsfield, J. B., Clerk	733 32		
Smith, G. L., Clerk	390 00		
Monroe, Eva, Stenographer	720 00		
Smith, M. H., Stenographer	480 00		
Disbursements	714 95		
		7,221 77	
Spry, W. L., Recorder	531 50		
Disbursements	221 21		
		752 71	
Carried forward	.....	30,863 94	387,369 24

Appendix No. 6.—Continued.

Service.	$ c.	$ c.	$ c.
Brought forward		30,863 94	387,369 24
MINING RECORDERS.—*Concluded.*			
Dominion Express Co.'y	226 67		
King's Printer	1,114 39		
Methodist Book Room	234 86		
Harcourt, E. H. Co.'y	158 04		
		1,733 96	
			32,597 90
PROVINCIAL ASSAY OFFICE.			
Turner, N. L.	1,200 00		
Disbursements	528 29		
		1,728 29	
Rothwell, T. E.	999 96		
Disbursements	290 15		
		1,290 11	
Supplies	505 11		
Disbursements	338 22		
Equipment	90 66		
		933 99	3,952 39
CULLERS' ACT.			
Oliver, J. A., Disbursements		23 58	
McDougall, J. T., Disbursements		2 95	
Bliss, C. L., services		4 00	
Close, J. L., services		12 00	
Livery		31 00	
Rainy River Navigation Co.'y, use of launch		10 00	
Town of Fort Frances, rent of hall		5 00	
Floyd, William, rent of tables		5 00	
Advertising		6 20	
			99 73
SURVEYS			129,338 51
BOARD OF SURVEYORS			200 00
CONTINGENCIES.			
Departmental.			
Printing and Binding	2,554 42		
Stationery	7,249 97		
		9,804 39	
Postage	2,190 85		
Express	316 19		
		2,507 04	
Telegraphing	606 47		
Telephone Messages	24 40		
Telephone Rent	47 05		
Car Fare	60 00		
		737 92	
Subscriptions	332 54		
Advertising	6,291 86		
		6,624 40	
Typewriters, rent and repairs	508 75		
Elliott-Fisher Co.'y, machine, etc.	240 50		
Corkill, E. T., Travelling expenses	11 00		
Johnston, H. E., Travelling expenses	79 45		
Carried forward	839 70	19,673 75	53,557 77

Appendix No. 6.—Concluded.

Service.	$ c.	$ c.	$ c.
Brought forward	839 70	19,673 75	553,557 77
CONTINGENCIES.—*Concluded.*			
Departmental.—Concluded.			
Kirkpatrick, G. B., Travelling expenses	69 50		
Rorke, L. V., Travelling expenses	101 10		
White, A., Travelling expenses	36 95		
Whitson, J. F., Travelling expenses	327 62		
Yates, Geo. W., Travelling expenses	35 14		
		1,410 01	
Extra Clerks	6,079 63		
Sundries	430 72		
		6,510 35	
			27,594 11
Bureau of Mines.			
Printing and Binding	1,149 70		
Stationery and Papers	2,311 36		
		3,461 06	
Telegraphing	285 84		
Express and cartage	107 84		
Advertising	4,263 28		
Subscription	215 75		
		4,872 71	
Gibson, T. W., Travelling expenses	21 80		
Johnston, H. E., Travelling expenses	200 00		
Moore, E. S., Disbursements	42 53		
Whitson, J. F., Travelling expenses	50 00		
Work, John do	279 75		
Souch, J. W.	105 35		
		699 43	
Typewriter and repairs	138 50		
Bell Telephone Co.'y	65 17		
Postage	437 30		
		640 97	
Extra Clerks	.....	1,002 66	
Nicholas, F. J., preparing index	76 50		
Determination of Leases	211 71		
Legal Fee	100 00		
Sundries	341 84		
		730 05	
			11,406 88
PROVINCIAL MINES	.....	.....	212 45
COMMISSIONS RE SUNDRY INVESTIGATIONS	.....	.....	148 89
REFUNDS	.....	.....	13,587 21
REFUNDS RE GOWGANDA TOWNPLOT	.....	.....	1,081 12
			607,588 43

D. GEO. ROSS,
Accountant.

AUBREY WHITE,
Deputy Minister, Lands and Forests.

Appendix No. 7.

Statement of Expenses on account of various services under the direction of the Department of Lands, Forests and Mines for the year ending October 31st, 1910.

Service.	$ c.
DIAMOND DRILL	13 00
ALGONQUIN PARK	13,352 78
RONDEAU PARK	2,371 50
VETERANS' COMMUTATION	2,050 00
	$17,787 28

D. GEO. ROSS,
Accountant.

AUBREY WHITE.
Deputy Minister of Lands and Forests.

Appendix No. 8.

WOODS AND FORESTS.

Statement of revenue collected during the year ending October 31st, 1910.

	$ c.
Amount of Western collections at Department	1,528,980 35
do Belleville collections	40,573 60
do Ottawa collections	265,528 76
	$1,835,082 71

J. A. G. CROZIER,
Chief Clerk in Charge.

AUBREY WHITE,
Deputy Minister.

Appendix No. 9.

PATENTS BRANCH.

Statement of Patents, etc., issued by the Patents Branch from 1st November, 1909, to 31st October, 1910.

Crown Lands	813
School do	30
Mining do	453
Public do (late Clergy Reserves)	4
Free Grant Lands (A. A.)	125
do (Act of 1880)	477
Rainy River Lands (Mining and Crown)	180
Mining Leases	160
Licenses of Occupation	31
Crown Leases	10
Crown Lands (University)	12
Mining do do	1
Free Grant, Act of 1901 (Veterans)	1,217
Temagami Islands	4
Rondeau Leases	4
Total	3,521

CHARLES S. JONES,
Chief Clerk.

AUBREY WHITE,
Deputy Minister.

Appendix

WOODS AND

Statement of Timber and Amounts accrued from Timber Dues, Ground

QUANTITY AND

Agencies.	Area covered by timber license.	Saw logs.				Boom and
		Pine.		Other.		Pine.
	Square miles.	Pieces.	Feet B.M.	Pieces.	Feet B.M.	Pieces.	Feet B.M.
Western Timber District	13,994½	11,096,599	469,093,674	1,415,824	51,464,961	233,669	28,266,239
Belleville Timber District	768¼	467,336	17,275,977	412,959	13,365,150	2,969	638,226
Ottawa Timber District	5,479	1,736,792	87,376,802	669,694	19,403,083	37,174	3,964,873
	20,241¾	13,300,727	573,746,453	2,498,477	84,233,194	273,812	32,869,338

General Statement

Agencies.	Cordwood.		Tan Bark.	Railway ties.	Posts.	Telegraph poles.	Car stakes.	Shingles.	Pulpwood.
	Hard.	Soft.							
	Cords.	Cords.	Cords.	Pieces.	Cords.	Pieces.	Cords.	Per 1,000	Cords.
Western Timber District	17,818	20,624	14,117	3,786,193	194	5,210	.....	23,500	75,073
Belleville Timber District	93	123	224	12,715	989	1,212	.....	.....	104½
Ottawa Timber District	150	4,903	435	4,748	139	801	3	.....	24,817½
	18,061	25,650	14,776	3,803,656	1,322	7,223	3	23,500	99,995

J. A. G. CROZIER,
Chief Clerk in Charge.

No. 10.

FORESTS.

Rent and Bonus during the year ending 31st October, 1910.

DESCRIPTION OF TIMBER.

Dimension.		Square Timber.				Piles.		Piling.	
Other.		Pine.		Hemlock.					
Pieces.	Feet B.M.	Pieces.	Cubic feet.	Pieces.	Cubic feet.	Pieces.	Lineal feet.	Pieces.	Feet B. M.
63,272	8,248,161	7,295	301,397	.....	.....	2,474	34,243	530	85,224
10,558	1,245,226	70	2,419	.....	.....	.....	.....	.....	.....
18,816	1,772,612	27	768	239	4,203	.....	.....	.....	.....
92,646	11,265,999	7,392	304,584	239	4,203	2,474	34,243	530	85,224

of Timber.—Concluded.

Amounts accrued.

Transfer bonus.	Interest.	Trespass.	Timber dues.	Bonus.	Deposits timber sale of 1910.	Ground rent.	Total.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
2,740 00	9,223 35	30,939 06	1,052,573 31	356,967 53	92,342 00	69,405 00	1,614,190 25
103 50	282 04	5,545 61	26,518 21	.....	.....	5,416 00	37,865 36
1,020 00	161 27	1,282 29	124,937 83	27,047 32	.....	29,360 00	183,808 71
3,863 50	9,666 66	37,766 96	1,204,029 35	384,014 85	92,342 00	104,181 00	1,835,864 32

AUBREY WHITE,
Deputy Minister.

Appendix No. 11.

Statement of the work done in the Military Branch of the Department of Lands, Forests and Mines, during the year ending the 31st October, 1910.

Letters received	6,000
Letters written	7,562
Maps supplied to Veterans	2,500
Location Certificates issued	85
Locations made	300
Surrenders	90
References for Patents issued	1,238
Locations cancelled for non-compliance with the regulations	261

R. H. BROWNE,
Chief Clerk in Charge.

AUBREY WHITE,
Deputy Minister.

Appendix No. 12.

Statement of the number of Letters received and mailed by the Department in 1908, 1909 and 1909-10.

Year,	Letters received.					Names indexed.	Orders-in-Council.	Returned letters.	Letters, circulars and reports mailed from Department.
	Sales and Free Grants.	Surveys.	Woods and Forests.	Mines.	Totals.				
1908	22,478	11,263	9,386	9,183	52,310	58,900	243	84	70,000
1909 (10 months).	19,500	16,016	9,086	8,398	53,000	59,400	178	72	62,800
1909-10. new fiscal year.	23,700	18,290	9,752	8,498	60,240	67,210	201	81	69,400

FRANK YEIGH,
Registrar,

AUBREY WHITE,
Deputy Minister.

Appendix No. 13.

Statement showing the number of Locatees and of acres located; of purchasers and of acres sold; of lots resumed for non-performance of the settlement duties and of patents issued under "The Free Grants and Homesteads Act" during the year ending 31st October, 1910.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Baxter	Muskoka.	J. B. Brown, Bracebridge	6	651	5	29	8	10
Brunel	"	" "	....	.....	...	.....	....	2
Cardwell	"	" "	6	925	1	13	6	2
Chaffey	"	" "	3	300	...	.....	3	2
Draper	"	" "	2	211	...	.....	2	4
Franklin	"	" "	4	517	5	15½	3	9
Freeman (pt.)	"	" "	32	4,418	2	11	....	3
Macaulay	"	" "	....	.....	1	1	....	1
Medora	"	" "	1	100	1	½	1	2
Monck	"	" "	....	.....	...	.....	....	....
Morrison	"	" "	3	434	2	2½	3	9
Muskoka	"	" "	....	.....	1	1	....	2
McLean	"	" "	8	988	...	.....	10	6
Oakley	"	" "	5	736	...	.....	4	1
Ridout	"	" "	3	372	2	169	3	2
Ryde	"	" "	2	243	...	.....	2	1
Sherborne	Haliburton	" "	2	160	2	86	1	2
Sinclair	Muskoka	" "	6	1,007	2	47	6	10
Stephenson	"	" "	....	.....	...	.....	....	....
Stisted	"	" "	....	.....	...	.....	....	1
Watt	"	" "	2	198	...	.....	2	1
Wood	"	" "	9	1,586	8	41	7	13
Burpee	Parry Sound.	F. R. Powell, Parry Sound	1	206	2	155	....	2
Carling	"	" "	6	685	1	1	3	6
Christie	"	" "	10	1,681	...	.....	8	1
Conger	"	" "	5	654	1	1½	3	9
Cowper	"	" "	...	.....	1	5½	....	....
Ferguson	"	" "	2	297	...	.....	1	....
Foley	"	" "	2	190	1	1	1	2
Hagerman	"	" "	10	1,646	2	6	8	5
Harrison	"	" "	1	200	8	72	....	8
Humphrey	"	" "	1	82	1	99	1	1
McConkey	"	" "	2	300	1	64	2	4
McDougall	"	" "	5	664	1	100	4	4
McKellar	"	" "	3	498	...	.....	1	2
McKenzie	"	" "	5	865	5	58	4	5
Monteith	"	" "	8	1,315	3	47	6	....
Shawanaga	"	" "	1	91	...	.....	....	6
Wilson	"	" "	1	34	...	.....	....	2
Chapman	"	Dr. J. S. Freeborn, Magnetawan.	8	905	...	.....	6	7
Croft	"	" "	1	209	2	13	1	5
Ferrie	"	" "	1	196	...	.....	1	1
Gurd	"	" "	8	1,079	1	2	2	4
Lount	"	" "	4	537	1	100	....	4
Machar	"	" "	7	1,296	...	.....	11	6
Mills	"	" "	4	438	1	50	2	1
Pringle	"	" "	6	895	...	.....	1	...

Appendix No. 13.—Continued.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Ryerson	Parry Sound	Dr. J. S. Freeborn, Magnetawan.	7	966	...	.....	9	4
Spence	"	" " "	9	1,289	...	.....	5	4
Strong	"	" " "	5	522	...	.....	4	3
Armour	Parry Sound	W. Jenkin, Emsdale.	3	318	...	.....	1	5
Bethune	"	" "	6	765	...	.....	3	3
Joly	"	" "	6	894	...	.....	4	5
McMurrich	"	" "	1	50	...	.....	1	3
Perry	"	" "	2	202	...	.....	2	4
Proudfoot	"	" "	4	651	1	12	....	5
Hardy	"	H. J. Ellis, Powassan.	....	.....	...	.....	....	....
Himsworth	"	" "	15	2,082	3	103	10	15
Laurier	"	" "	1	200	1	31	2	2
Nipissing	"	" "	8	1,144	1	21	5	9
Patterson	"	" "	4	700	...	.....	2	2
Bonfield	Nipissing	W. J. Parsons, North Bay	11	1,180	...	.....	8	7
Boulter	"	" "	....	.....	...	.....	....	....
Chisholm	"	" "	14	1,981	4	224	9	12
Ferris	"	" "	12	1,388	...	.....	8	7
Anson	Haliburton	R. H. Baker, Minden	....	.....	...	.....	....	....
Glamorgan	"	" "	8	964	2	14	4	3
Hindon	"	" "	....	.....	...	.....	....	....
Lutterworth	"	" "	1	67	...	.....	....	1
Minden	"	" "	2	200	...	.....	2	5
Snowdon	"	" "	3	400	...	.....	3	....
Stanhope	"	" "	7	634¾	...	.....	7	1
Anstruther	Peterboro'	T. G. Eastland, Apsley	....	.....	...	.....	....	1
Burleigh, N.D.	"	" "	1	98	...	.....	1	2
" S.D.	"	" "	....	.....	...	.....	....	1
Chandos	"	" "	6	618	...	.....	5	6
Methuen	"	" "	2	150	...	.....	1	1
Cavendish	Peterboro'	James Wilson, Kinmount	1	73	...	.....	....	....
Cardiff	Haliburton	" "	2	259	...	.....	2	5
Galway	Peterboro'	" "	3	486	1	1	4	2
Monmouth	Haliburton	" "	8	993	...	.....	6	5
Bangor	Hastings	J. R. Tait, L'Amable	6	497½	...	.....	1	1
Carlow	"	" "	3	373	...	.....	....	....
Cashel	"	" "	1	111	...	.....	1	2
Dungannon	"	" "	1	99	...	.....	1	1
Faraday	"	" "	2	351½	1	16	6	3
Herschel	"	" "	4	421	1	1	3	3
Limerick	"	" "	1	100	1	1	1	1
Mayo	"	" "	....	.....	1	5	....	1
Monteagle	"	" "	5	667	1	1	5	4
McClure	"	" "	1	119	...	.....	....	2
Wicklow	"	" "	3	315	1	23½	2	4
Wollaston	"	" "	1	100	...	.....	1	2
Algona, S.	Renfrew	Adam Prince, Wilno	1	100	...	.....	....	2
Brougham	"	" "	3	303	1	2	1	....
Brudenell	"	" "	5	500	1	21	5	....

Appendix No. 13.—Continued.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Burns	Renfrew	Adam Prince, Wilno	9	1,233	...	...	3	....
Grattan	"	" "	9	897	...	...	4	1
Griffith	"	" "	1	91	...	...	1	....
Hagarty	"	" "	5	500	1	67½	4	3
Jones	"	" "	1	189	...	...	....	....
Lyell	Nipissing	" "	2	302	1	10	3	2
Lyndoch	Renfrew	" "	5	559	2	7½	2	2
Matawatchan	"	" "	2	196	...	...	....	....
Radcliffe	"	" "	6	800	...	...	9	1
Raglan	"	" "	8	960½	...	...	5	8
Richards	"	" "	14	1,726	...	...	7	1
Sebastopol	"	" "	3	247	...	...	1	2
Sherwood	"	" "	5	432	1	23½	3	3
Algona, N.	Renfrew	D. B. Warren, Pembroke	1	93	...	...	....	....
Alice	"	" "	2	182	...	...	1	....
Buchanan (pt)	"	" "	1	208	1	8	1	2
Fraser	"	" "	1	100	...	...	....	1
Head	"	" "	....	.....	...	...	....	....
Maria	"	" "	....	.....	...	...	....	....
McKay (pt)	"	" "	....	.....	...	...	....	....
Petawawa	"	" "	1	100	...	...	1	1
Rolph	"	" "	3	394	...	...	2	1
Wilberforce	"	" "	....	.....	...	...	....	1
Wylie (pt)	"	" "	1	200	...	...	1	....
Calvin	Nipissing	Robert Small, Mattawa	1	100	...	...	....	1
Cameron (pt)	"	" "	3	393	1	9	....	2
Lauder	"	" "	....	.....	...	...	....	....
Mattawan	"	" "	....	.....	1	2	....	4
Papineau	"	" "	5	574	...	...	2	2
Korah	Algoma	B. J. Rothwell, Sault Ste.	1	162	...	...	1	2
Parke	"	" " Marie	1	156	...	...	2	1
Prince	"	" "	5	723	1	80	5	5
Aberdeen	"	Thos. Buchanan, Thessalon	3	548½	...	...	1	6
" add.	"	" "	1	162½	1	2½	....	....
Galbraith	"	" "	3	475	1	6½	....	6
Lefroy	"	" "	....	.....	...	...	....	1
Plummer	"	" "	1	160	...	...	1	1
" add.	"	" "	....	.....	...	...	....	....
St. Joseph Is'd	"	W. E. Whybourne, Marksville	12	1,267	...	...	11	1
Merritt	"	R. J. Byers, Massey	5	765	1	39	....	1
Blake	Thunder Bay	H. A. Keefer, Port Arthur	8	1,120	...	...	4	8
Conmee	"	" "	34	5,021	...	...	20	12
Crooks	"	" "	6	1,033	...	...	....	....
Dawson Road	"	" "	40	4,207	...	...	33	1
Dorion	"	" "	5	749	2	72	6	12
Gillies	"	" "	6	961½	6	354	5	7
Gorham	"	" "	25	3,877½	1	179½	18	6
Lybster	"	" "	7	1,066½	1	6½	7	8
Marks	"	" "	24	3,816	1	1	11	13
McIntyre	"	" "	3	336	...	...	5	3
McGregor	"	" "	7	1,126	1	3	5	....

Appendix No. 13.—Continued.

Township.	District or County.	Agent.	No. of persons located.	No. of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
O'Connor	Thunder Bay	H. A. Keefer, Port Arthur,	7	1,126½	3	158½	7	9
Oliver	"	" "	10	1,613	1	1	10	8
Paipoonge, N R	"	" "	1	100	...	.....	1	9
" S R	"	" "	8	986	...	.....	9	4
Pardee	"	" "	....	.....	...	.....	....	9
Pearson	"	" "	6	970	2	320½	2	1
Scoble	"	" "	16	2,311	2	88	6	10
Strange	"	" "	10	1,597½	3	117	5	13
Ware (pt)	"	" "	38	6,974	...	.....	2	4
Atwood	Rainy River	William Campbell, Stratton	....	.....	...	.....	....	....
Blue	"	" "	4	479	1	82	6	5
Curran	"	" "	5	728	3	86	4	5
Dewart	"	" "	3	480	...	.....	3	3
Dilke	"	" "	3	406	2	44	3	3
Morley	"	" "	5	646	4	10	4	9
Morson	"	" "	53	8,106¼	13	576½	34	....
McCrosson	"	" "	9	1,319¾	2	175	13	7
Nelles	"	" "	12	1,938	5	131	11	8
Pattullo	"	" "	6	629	3	90	5	5
Pratt	"	" "	7	1,118½	2	62	9	1
Rosebery	"	" "	....	.....	...	.....	....	....
Shenston	"	" "	1	160	4	48	1	6
Spohn	"	" "	16	2,535	3	127	15	1
Sutherland	"	" "	14	2,257	4	227	13	3
Sifton	"	" "	9	1,474	3	129½	10	71
Tait	"	" "	2	322	5	119	3	12
Tovell	"	" "	4	637	7	387½	3	5
Worthington	"	" "	2	276	3	111	2	5
Aylsworth	Rainy River	Alex. McFayden, Emo	1	162	1	20	1	2
Barwick	"	" "	1	118	...	.....	....	2
Burriss	"	" "	5	819½	10	345	3	17
Carpenter	"	" "	11	1,808	4	104	14	4
Crozier	"	" "	6	1,025	6	222	7	7
Dance	"	" "	22	3,596½	1	39½	17	7
Devlin	"	" "	2	202½	7	133	5	7
Dobie	"	" "	5	796	3	126	3	9
Fleming	"	" "	1	160	...	.....	....	1
Kingsford	"	" "	10	1,521	6	329	9	8
Lash	"	" "	2	244	7	171½	3	11
Mather	"	" "	2	335	1	49	2	8
Miscampbell	"	" "	10	1,517½	2	79½	10	10
Potts	"	" "	5	763½	...	.....	3	6
Richardson	"	" "	7	1,117	3	160	3	9
Roddick	"	" "	....	.....	...	.....	....	....
Woodyatt	"	" "	2	244	...	.....	2	....
Aubrey	Rainy River	R. H. Pronger, Dryden	12	1,586½	1	114	10	10
Eton	"	" "	5	691¾	...	.....	2	6
Langton	"	" "	1	158½	...	.....	....	....
Mutrie	"	" "	15	2,267	2	91	12	7
Rugby	"	" "	....	.....	...	.....	....	2
Sanford	"	" "	4	632	1	40	3	4
Southworth	"	" "	3	390	1	2	....	5
Temple	"	" "	9	1,380	...	.....	1	....
Van Horne	"	" "	2	166	3	81	1	3
Wabigoon	"	" "	38	5,821½	1	71½	....	....
Wainwright	"	" "	6	791	1	39½	6	9

Appendix No. 13.—Concluded.

Township.	District or County.	Agent.	No. of persons located.	No of acres located.	No. of purchasers.	No. of acres sold.	No. of lots resumed.	No. of patents issued.
Zealand.....	Rainy River..	R. H. Pronger, Dryden.....	8	867	1	23¾	3	7
Melick.....	"	W. L. Spry, Kenora.....	12	1,903½	3	217½	17	6
Pellatt.....	"	" "	10	1,266	1	32	9	2
Blezard.....	Sudbury.....	J. A. Lemieux, Blezard	5	636½	...	.....	....	3
Capreol	"	" Valley	16	2,259¼	2	29	3	11
Hanmer.....	"	" "	33	4,119½	5	96	6	15
Balfour.....	Sudbury	J. K. MacLennan, Sudbury ..	9	1,378	1	160	2	5
Broder.....	"	" "	13	1,648	1	71	3	7
Chapleau.....	Algoma	" "	2	275	3	377	....	1
Dill.....	Sudbury	" "	9	1,262¾	1	7	....	6
Garson.....	"	" "	17	2,395½	6	175	2	5
Neelon.....	"	" "	17	2,382½	6	227	5	10
Rayside.....	"	" "	2	249	...	.....	1	1
Appleby.....	Sudbury	E. A. Wright, Warren.....	7	1,136½	1	9½	....	5
Casimir	"	" "	4	787	3	9	1	6
Dunnet.....	"	" "	6	810½	1	5	....	6
Hagar	"	" "	10	1,648½	2	163	4	6
Jennings	"	" "	7	1,044	1	39	....	5
Kirkpatrick ..	Nipissing ...	" "	7	1,069¾	2	12	....	3
Ratter.....	Sudbury	" "	.....	.....	2	17½	....	5
Caldwell.....	Nipissing	J. A. Philion, Sturgeon Falls.	10	1,232	1	80	....	22
Cosby.....	Sudbury	" "	2	324	2	5	....	8
Grant.....	Nipissing . ..	" "	3	357	1	85	....	....
Macpherson ..	"	" "	14	2,068¼	...	.....	....	7
Martland	Sudbury	" "	19	2,762	1	4½	1	22
Springer	Nipissing	" "	3	475	...	.....	....	16
Abinger.....	Lennox and Addington	Charles Both, Denbigh	2	199	...	.....	1	1
Clarendon....	Frontenac....	" "	3	396	...	.....	....	....
Denbigh.. .	Lennox and Addington	" "	3	495	...	.....	....	3
Canonto, S....	Frontenac....	" "	.....	.....	...	.....	....	....
" N...	"	" "	.....	.....	...	.....	....	....
Miller (pt.)...	"	" "	1	50	...	.....	1	....
Palmerston (pt)	"	" "	1	105	...	.....	1	1
Airy.....	Nipissing	Unattached	6	817	3	51	1	2
Finlayson....	"	"	.....	.....	...	.....	....	....
Murchison ...	"	"	.....	.....	...	.....	....	....
Sabine	"	"	9	1,388	1	10	1	1
			1,379	194,760	296	9,753¼	796	947

W. C. CAIN,
Clerk in Charge.

AUBREY WHITE,
Deputy Minister.

Appendix No. 14.

Statement of Municipal Surveys for which instructions issued during the 12 months, ending October 31st, 1910.

No.	Name of Surveyor.	No.	Date of Instructions.	Description of Survey.
1	E. T. Wilkie....	680	Jan. 18, 1910.....	To survey the town line between the townships of Nepean and North Gower, in the County of Carleton, and to plant permanent monuments at all points of intersection with concession lines or side roads running thereto through either township.
2	J. J. McKay..... (Tyrrell & McKay)	680a	July 27, 1910....	To survey certain concessions, road allowances, etc., formerly in the township of Barton, now in the City of Hamilton.
3	Thomas H. Dunn.	681	Oct. 26, 1910	To survey the boundary road allowance between the townships of Osnabruck and Cornwall, and to have the said boundary marked by permanent stone or iron monuments at the expense of the municipality of the township of Osnabruck, in the County of Stormont.
4	S. E. Farley	682	Nov. 16, 1910....	To survey the original road allowance between lot 30, concession 2, Ottawa Front, and lots lettered J., K., L., M., and N., concession A., Rideau Front, in the township of Nepean, in the county of Carleton, and to define said road allowance by permanent monuments on each side thereof.

GEORGE B. KIRKPATRICK,
Director of Surveys.

AUBREY WHITE,
Deputy Minister of Lands and Forests.

Appendix No. 15.

Statement of Municipal Surveys confirmed during the 12 months ending October 31st, 1910.

No.	Name of Surveyor.	No.	Date of Instructions.	Description of Survey.	Date when confirmed under R.S.O., 1897, Chap. 181, secs. 10–15 inclusive.
1	C. D. Bowman	664	Feb. 5, 1908	To survey part of the line between the township of Waterloo, in the county of Waterloo, and the township of Guelph, in the county of Wellington, from the north-easterly angle of the township of Waterloo, southerly along the easterly limits of lots 97, 98, 99 and 100 of the German Company Tract of Waterloo, and to mark by stone or other permanent monuments at the several corners in the easterly limit of the said township of Waterloo, and also at each end of the several concession lines of the township of Guelph abutting on said boundary between the said points.	Jan. 25, 1910.
2.	Ernest G. Barrow...	665	May 2, 1908.....	To survey the limits of the original allowance for road between the broken front and the 1st concession of the township of Barton, in the county of Wentworth, known as the base line and now within the limits of the City of Hamilton, said survey to be made from the intersection of the said base line with the allowance for road between lots Nos. 4 and 5, in the said township of Barton known as Ottawa Street, to the westerly terminus of such base line, and that durable monuments be placed marking the limits of the original allowance for road between the above points.	Jan. 19, 1910.
3.	Alex. Niven.....	672	June 12, 1909....	To survey the lines of the streets in the town of Niagara, and to mark the same by suitable monuments in such a manner as the proper lines thereof may at any time be laid down upon the ground.	May 27, 1910.
4.	Thomas H. Dunn	674	Aug. 6, 1909.....	To survey the concession line and road between the 10th and 11th concessions of the township of Winchester across lots Nos. 12, 13, 14, 15, 16, and the west half of lot No. 17, in the 10th concession of the township of Winchester, or as far as may be necessary to find original or undisputed monuments on each side, and to plant permanent monuments to mark the said road on each side.	Feb. 28, 1910.

Appendix No. 15.—Concluded.

Statement of Municipal Surveys confirmed during the 12 months ending October 31st, 1910.—*Concluded.*

No.	Name of Surveyor.	No.	Date of Instructions.	Description of Survey.	Date when confirmed under R.S.O., 1897, Chap. 181, secs. 10–15 inclusive.
5.	Alex. Niven	675	Oct. 5, 1909	To survey the southern boundary, of the town of Niagara, and to define the same by durable monuments.	May 27, 1910.
6.	Frank E. Patterson .	677	Dec. 8, 1909.....	To survey the boundary lines of the road known as McArthur Avenue, running in an easterly direction from the Rideau River, a distance of about one mile, through the village of Eastview, being the centre of lot No. 7, junction gore, Township of Gloucester, and to plant stone or other durable monuments at the front angles of lots and blocks fronting on McArthur Ave. within the limits of said village of Eastview.	Oct. 14, 1910.
7.	Maurice Gaviller....	678	Dec. 23, 1909....	To survey the side road between lots 9 and 10 in the 12th concession of the township of Nottawasaga, and to mark the said road on either side by permanent monuments.	Sept.16,1910.
8.	E. T. Wilkie	679	Dec. 27, 1909....	To survey the concession line between the 8th and 9th concessions, of the township of Hinchinbrooke, from lot 12 south to lot 8, and to define the same by permanent boundaries.	Nov. 18,1910.

GEORGE B. KIRKPATRICK,
Director of Surveys.

AUBREY WHITE,
Deputy Minister of Lands and Forests.

Appendix No. 16.

Statement of Crown Surveys in progress during the twelve months ending October 31st, 1910.

No.	Date of Instructions.	Name of Surveyor.	Description of Survey.	Amount Paid,
				$
1	Mar. 19, 1910	A. G. Ardagh	To survey islands in Georgian Bay in front of Harrison & Shawanaga.....	4,000
2	Mar. 21, 1910	D. Beatty	To survey islands in the Georgian Bay, in front of Conger & Cowper.....	2,500
3	Apr. 18, 1910	C. H. Fullerton ..	To survey outlines of townships surrounding Night Hawk Lake and to south thereof, District of Nipissing	3,300
4	Apr. 16, 1910	J. H. Burd	To survey islands in the Georgian Bay, in front of McDougall, Carling, etc.	5,000
5	Apr. 22, 1910	L. R. Ord	To survey islands in the Georgian Bay, in front of Wallbridge	3,500
6	May 2, 1910	Speight & Van Nostrand	To survey Base and Meridan lines, District of Algoma	11,750
7	May 3, 1910	J. W. Fitzgerald.	To survey outlines of townships, Districts of Nipissing and Sudbury.....	5,500
8	May 10, 1910	A. Niven	To survey town plot at Superior Junction, District of Kenora	1,000
9	May 11, 1910	J. Hutcheon	To survey Township of Machin, District of Sudbury	10,000
10	May 17, 1910	A. S. Code	To survey outlines of the townships north of Aylmer, District of Sudbury.....	4,500
11	May 27, 1910	J. Newman	To survey township outlines north of the township of McNish, District of Nipissing.....	3,000
12	June 9, 1910	Bush & Paulin ..	To traverse lakes in District of Algoma.....	2,800
13	July 5, 1910	W. Beatty	To survey part of the township of Alexandra, District of Sudbury	2,000
14	July 17, 1910	A. D. Griffin	To survey residue of the Townships of Maisonville and Benoit, District Nipissing	3,200
15	Sept. 2, 1910	E. Seager	To survey timber berths 1, 2, 3 and 4, District of Kenora	400
16	Aug. 19, 1910	T. B. Speight ...	To survey town plot at Missinaibi, District of Algoma	450
17	Dec. 7, 1910	T. D. Green	To traverse Gun and Sand Lakes and survey the islands therein, District of Kenora.....	1,000
18		L. V. Rorke, Inspector of Surveys	Inspection of surveys	2,200
19	Mar. 23, 1910	C. H. Fullerton	To survey Night Hawk Lake and islands therein, District of Nipissing	0,000
				66,100

GEORGE B. KIRKPATRICK,
Director of Surveys.

AUBREY WHITE,
Deputy Minister of Lands and Forests.

Appendix No. 17.

Statement of Crown Lands surveyed, completed and closed during the 12 months, ending October 31st, 1910.

No.	Date of Instructions.	Name of Surveyor.	Description of Survey.	Amount paid.	No. of acres.
1	May 17, 1909....	C. H. Fullerton ..	Survey of lots 5 and 6, Township of James, District of Nipissing	491 45	
2	May 18, 1909. ..	Speight & Van Nostrand	Survey of Base & Meridian lines, Districts of Sudbury and Algoma	750 00	
3	July 29 1909....	G. S. Abrey	Survey of Township of Wabigoon, District of Kenora	1,289 98	22,917
4	May 20, 1909 ..	F. W. Paulin	Survey of timber berths, District of Thunder Bay	61 75	
5	May 27, 1909 ...	H. J. Beatty	Survey of outlines, Temagami Forest Reserve	1,235 43	
6	May 31, 1909 ...	W. & D. Beatty ..	Survey of Township of Blount, District of Nipissing	2,102 77	51,524
7	May 31, 19 ...	J. Hutcheon	Survey of Township outlines, Districts of Nipissing and Sudbury	3,420 00	
8	June 1, 1909.. ..	J. S. Dobie	Survey of Township outlines, Mississaga Forest Reserve....	856 73	
9	May 25, 1909. ..	Cavana & Watson	Survey of Township outlines, Mississaga Forest Reserve....	1,436 15	
10	May 25, 1909....	T. J. Patten	Survey of Township outlines, Mississaga Forest Reserve....	3,323 34	
11	July 22, 1909....	C. H. Fullerton ..	Survey of Township outlines, District of Nipissing.....	1,427 60	
12	July 26, 1909....	J. W. Fitzgerald.	Survey of Township outlines, District of Sudbury.....	466 47	
13	Oct. 4, 1909.....	J. H. Burd	Survey of timber berths E., F., I. and J., District of Algoma..	1,572 77	
14	May 20, 1909....	G. S. Abrey	Survey of timber berths, District of Rainy River	4 20	
15	Dec. 31, 1908.....	L. V. Rorke	Survey of outlines of Townships, Temagami Forest Reserve....	1,838 47	
16	April 28, 1910...	Cavana & Watson..	To survey Township outlines, District of Sudbury.....	5,055 00	
17	April 28, 1910...	Lang & Ross	To survey township outlines, District of Sudbury.....	5,769 62	
18	May 4, 1910.....	DeMorest, Stull & Low	To survey Township outlines, District of Sudbury.....	5,038 95	
19	May 9, 1910.....	T. J. Patten	To survey outlines of Townships, Mississaga Forest Reserve....	5,272 44	
20	May 25, 1910 ..	J. S. Dobie	To survey outlines of Townships, Mississaga Forest Reserve....	5,042 59	
21	May 2, 1910 ...	H. J. Beatty	To survey Township outlines, West of Godfrey, District of Sudbury	6,130 30	
22	Aug. 19, 1910 ..	A. Lougheed	To survey timber berths in District of Thunder Bay	841 18	
23	Aug. 11, 1910 ..	A. L. Russell	To survey lots 18 to 24, con line 1-2, Dawson Road	45 70	
24	.....	L. V. Rorke, Inspector of Surveys	Inspection of surveys.....	195 93	
		Hector McDonald.	*Re* blazing timber berths 151, 157, 145 and 139	512 59	
		E. H. Harcourt & Co.	Printing maps	7,706 35	

Appendix No. 17.—Continued.

Statement of Crown Lands surveyed, completed and closed during the 12 months.— Continued.

No.	Date of Instructions.	Name of Surveyor.	Description of Survey.	Amount paid.	No. of acres.
		C. Tarling & Co...	Mounting maps	748 70	
		Rice Lewis & Sons	Iron posts	387 80	
		C. E. Henderson.	2 canoes and 6 paddles for use, F. W. Paulin, O. L. S.	91 00	
		A. T. Fife	Hardware for use by O. L. S. Seager on survey of timber berths S. 41, 42 and 43.....	23 20	
		F. A. Child	Express, iron posts, Matheson & Porcupine	4 60	
		Map Specialty Co.	Maps	87 50	
		Chas. Potter	Charts for use of Surveyors ...	7 95	
				$63,238 51	

GEORGE B. KIRKPATRICK,
Director of Surveys.

AUBREY WHITE,
Deputy Minister of Lands and Forests.

Appendix No. 18.

Survey of Base and Meridian Lines, Districts of Algoma and Sudbury, 1909.

Toronto, 27th December, 1909.

Sir,—We have the honor to submit the following report on the survey of certain base and meridian lines in the Districts of Algoma and Sudbury, made by us during the past summer under instructions from your Department, dated 18th May, 1909.

Upon receipt of the instructions we immediately proceeded to make arrangements for supplies, of which nearly six tons, exclusive of camp equippage, were required. With nine men from Toronto and vicinity, we left for Woman River Station, on the Canadian Pacific Railway, on 1st June, and upon our arrival were joined by eleven other men from various parts of New Ontario. Additions to the party were made from time to time as occasion required, the maximum force at any time being thirty, all told. The work was in charge of T. B. Speight, O.L.S., assisted by T. D. le May, O.L.S.

The instructions state that the point of commencement is marked by "an iron post on the north side of the right of way of the Canadian Pacific Railway, about a mile and a half east of Woman River Station, on the line between Townships numbers 18 and 19, as partially outlined by O.L.S. E. Stewart, which post is distant 76 links north of the centre of said right of way and marked 18 M. on the east and 19 M. on the west side, said post is also distant 91 chains and 37 links from the south-west angle of Township 18 as surveyed by O.L.S. Stewart." Upon careful search it was found that the post referred to had been removed and its accompanying wooden post destroyed by fire, and it was necessary to determine the point by measuring from the iron post and point of old spruce post still remaining on the south side of the right of way, verifying these as to original position by measuring from the five mile post on O.L.S. Stewart's meridian.

A beginning was made on 3rd June from the initial point so established, and the work was prosecuted continuously, with the exception of one week, which was lost in re-outfitting after the destruction of about half of our camp effects and instruments by a forest fire which swept in from the north-west on 11th June.

The first meridian was run from the above point of commencement north for about sixty-five miles to the base line run by O.L.S. A. Niven in 1899. It may here be noted that this base line forms the division between the systems of "six-mile townships" to the south and "nine-mile townships" to the north. At the forty-eighth mile post on this meridian, a base line was run east about nineteen miles, to a point on the Ground Hog River about five miles north-east from the Hudson's Bay Company's trading point known as Flying Post; and, from the same mile post, about twelve miles west, to connect with the Township of Paul near its north-east angle. These two lines are referred to herein as the "first base line."

At the seventy-second mile post on O.L.S. Niven's base line, being about one and three-quarters miles west of the termination of the sixty-five mile line referred to, the first meridian was continued twenty-seven miles north along

the boundary between the Districts of Algoma and Sudbury and from its north end a base line, referred to herein as "third base line," was run west about twenty miles to the western terminus of the season's work. From the eighteenth mile post on the north twenty-seven miles of the first meridian line, referred to herein as the "second base line," was run west for a distance of eleven miles. At the ninth mile post on the third base line, lines were run north and south respectively for a distance of nine miles, and referred to herein as the "second meridian."

From the eighteenth mile post on the same base line meridians were run similarly north and south respectively nine miles, and termed herein "third meridian."

The meridian lines are run due north astronomically and the base lines due west (or east) on chords of parallels of latitude, those to the south of the Niven base line being chords of six miles in length, and those to the north of that line, nine miles long. A wooden post of the most durable material, within reasonable distance, was planted at the end of each mile on the lines south of the Niven base line, and in addition, iron posts one and one-quarter inches in diameter were planted alongside the wooden posts at the end of each sixth mile in that tract. On the lines north of Niven's base line, the interval between wooden posts was made one and a half miles, and between iron posts nine miles. On each wooden post and iron post the number of the mile it represented was carefully marked on the side nearest the initial point of the line. Where a corner occurred in a lake or other natural feature, precluding the planting of posts, the post was planted upon the nearest suitable point of land and upon the line run, the distance of such post from the true corner being entered in the notes and marked upon the post. In all cases where wooden and iron posts are planted side by side, the iron post indicates the intended corner. All lines were well opened out and properly blazed.

Frequent astronomical observations, records of a number of which are appended, were taken for the purpose of verifying the course of the lines run, but owing to a series of accidents to the instruments it was impossible to note frequently the magnetic variation, the average declination being about four and a half degrees west.

A careful watch was kept for indications of the exploration line run by P.L.S. Duncan Sinclair in 1867, but the repeated fires which have swept over this region in the interval have rendered it impossible of positive location at this point. Certain marks which we believe to define the line in question were seen and noted, and we have shown the position of these upon the accompanying map as "Probable location of Sinclair's line."

The return journey was made by way of the Kapuskasing and Trout River canoe routes to Chapleau, which was reached on 25th September.

General Features.

All the country embraced by this survey lies in the valleys of the Woman, Ridout, Pishkanogami, Ground Hog, and Kapuskasing Rivers, a total breadth of thirty-nine miles from east to west and one hundred and one miles from north to south being included. Generally speaking, the surface is rolling, and, in places, hilly, some of the hills reaching an altitude of two hundred feet. To the south of the clay belt, the southern boundary of which was met about ten miles north of Niven's base line and trends thence in a north-westerly direction,

the soil is of inferior quality for agricultural purposes, but in the southern twenty-two miles of the work the surface indications are such as to attract prospectors for iron.

Rivers, streams and lakes abound, particularly in the southern part of the work and numerous swampy areas were seen. Fire has swept, within the past twenty-five years, over nearly all the southern half of the tract covered by the survey, and as a consequence there is little timber of value now standing. In the remaining part, including the clay belt, less damage has been done by fire.

Soil.

As above intimated only a comparatively small part of the survey lay within the clay belt, the remainder comprising stony, rocky and sandy soil. The clay belt itself is not here of as good quality as that to the north, but in the vicinity of the Kapuskasing there is a fair sized area of excellent land, and the proportion of good soil increases to the north and north-east.

Timber.

To the south of Pishkanogami Lake the timber is nearly all of second growth, but small areas of the original growth, which had escaped the fire, were seen.

A tract of probably fifty or sixty square miles from the Ridout River eastward and from the tenth to the fifteenth miles on the first meridian was fire-swept during our survey, and no timber of value remains. On the first meridian between Pishkanogami Lake and the first base line, a number of groves of white and red pine of good quality were seen. On the first base line, both east and west of the first meridian, a fair quantity of spruce and poplar, suitable for pulpwood, and banksian pine and tamarac for railway ties, was found.

In the fifth and sixth miles of the first base line east of the first meridian, groves of red and white pine occur also at a point on the Pishkanogami River, about two miles north from the mouth of the Muskego River, there is a grove of red pine of good quality, ranging up to twenty-four inches in diameter. In fact, taking into account both quality and quantity, this region is the most promising for white and red pine that we have noted in the James Bay watershed.

Along the valley of the Kapuskasing River, spruce, poplar, birch and tamarac with occasional groves of banksian pine and scattered cedar, are found. The poplar and spruce are of good quality, and capable of supplying timber for local purposes.

To the west of the fifteenth mile on the third base line the country has been visited by fire, probably fifteen or twenty years ago, and the growing timber is of little value at present.

Water.

The whole district is well watered by rivers, streams and lakes, with water of good quality.

Rapids and small falls on the Woman, Ridout, Pishkanogami and Kapuskasing Rivers are sufficient to supply power for mining and other local purposes. The most important of these falls noticed was on the Pishkanogami River, about three miles down stream from the lake of that name, which forms a natural

reservoir, the lake itself being about twenty-five miles in length and from one-half to two and a half miles in breadth. The next falls of importance is on the Kapuskasing River, about three miles down stream from Kapuskasing Lake; the latter having an area of probably at least five square miles.

Minerals.

In the south twenty-two miles of the first meridian, surface indications of iron ore were frequently seen and already a number of prospectors were operating. In our opinion it is a promising field and probably will be found to extend eastward to the point on the Woman River where development work has been in progress for more than two years.

In the remainder of the work no indications of economic minerals were noted, but the dense undergrowth gave little opportunity for observation. Outcroppings of rock were seen at intervals, chiefly of granite, in the northern part.

Game.

Moose were very numerous, and bear were seen occasionally. Small game was scarce. Fish were abundant in all the main streams and larger falls. On the Pishkanogami River speckled trout were particularly plentiful as were pickerel in Goose Lake.

General Remarks.

A much smaller portion of agricultural land was met with in this season's work than has usually been the case with our contracts during several years previous but this is due to the fact that only a fringe of the great clay belt was encountered. The work will, however, be of considerable value for a number of reasons, among which are: the service in connecting adjacent detached systems of survey, the necessity for locating mineral claims, particularly in the southern part, and the knowledge gained respecting the territory to be crossed by the Canadian Northern Railway, surveys of which are now in progress to the north of Ground Hog Lake and across the first base line east of the meridian.

We have the honour to be,

Sir,

Your obedient servants,

(Signed) Speight & VanNostrand.

The Honourable, the Minister of Lands, Forests and Mines,
Toronto, Ont.

Appendix No. 19.

SURVEY OF OUTLINES OF TOWNSHIPS NORTH OF LAKE HURON, DISTRICT OF ALGOMA.

THESSALON, ONTARIO, December 15th, 1909.

Sir,—I beg to report that in accordance with your instructions dated June 1st, 1909, I have completed the survey of Township Outlines, in, and adjacent to, the western portion of the Mississaga Forest Reserve.

In reaching the starting point of the survey, I used the well-known canoe route from Wakami Siding on the main line of the Canadian Pacific Railway to the Mississaga River via the Kapuskasing and Wenebegon Rivers.

The survey was commenced on the afternoon of July 31st at the 6th mile post on the meridian line run by O.L.S., A. Niven, in 1902, this point being the north-east corner of Township 3.E. From this point the survey was continued without interruption until the middle of October when unfavorable weather made it impossible to continue. On October 15th there was twenty inches of snow on the ground, and work under these conditions with a summer outfit became impossible. I therefore broke camp and came out to the Algoma Central Railway, where I discharged my men for the time being. The weather moderated after this, however, and by November 1st the snow had about disappeared. I therefore took a small crew of men and returned to the point where work had been suspended, and completed the survey.

Your instructions were followed as closely as possible in performing the survey. It was found necessary, however, to run a few of the lines in the opposite direction to that mentioned in the instructions. This course was rendered necessary on account of the great difficulty in making long moves for the whole party. The lines which were reversed are as follows: The north boundary of Township 5 E., east boundary of Township 3 F, east boundary of Townships 3 H. 4 H, 5 H, north boundary of Township 3 G, and the north boundary of Township 22, Range XII. The field notes in all cases were entered in the order in which the lines were run and the posts were all numbered from the south towards the north and from the east towards the west, with the exception of the east boundary of Township 202, on which the posts are numbered from the north towards the south.

The lines were all well cut and blazed and good, durable posts were planted wherever required. If possible, mounds of stone were erected at the posts. Iron posts were erected at each of the township corners with the designation of the township marked thereon with a cold chisel. In some cases, however, where the corner came near an iron post planted last year, a new iron post was not erected. The usual wooden post was planted at the intersection of the lines and the distance measured and recorded to the iron post planted on the line run last year. The measurements to these posts are all shown on the plan, and also in the field notes. Wherever the end of a mile came in a lake or river, a post was planted on the nearest shore and the chainage marked on the post with a scribing iron. Bearing trees were marked wherever possible, and all marks were made with a proper timber scribe. All lakes and rivers were carefully triangulated and the calculations are entered in the proper place in the field notes.

Timber.

The greater portion of the territory covered by the survey is untouched by fire and contains timber of great value. The prevailing timber is white and red pine, spruce, balsam, cedar, white birch, yellow birch and maple. White pine of good quality is to be found scattered all over the area surveyed and in some places the growth is very heavy.

The following report on each township separately will give an idea of the location of the most valuable timber and of the burnt areas, and also an approximate idea of the relative value of the various townships as far as could be seen from the survey lines. *3 E.* This township is not damaged much by fire. Red and white pine are very plentiful in the north-east corner. There is also considerable pine in the north-west corner and along the Mississaga River, except a small area which was over-run by fire about fifteen years ago. In the southern portion of the township there is considerable yellow birch and maple of poor quality, but with white pine scattered throughout. A portion of the south-west corner was burnt over about fifteen years ago. Throughout the whole township there is a great deal of fine spruce, also much balsam and white birch. The pine and pulpwood are of very great value.

4 E. Fire over-ran the south-west corner of this township some years ago and probably twenty-five per cent. of the total area has been burnt over, and contains no timber of any value. The remainder is heavily timbered with pine, spruce, balsam, birch, cedar, etc. The pine especially in this township is very valuable.

5 E. This township is very much the same as 4 E. About twenty-five per cent. has been swept by fire and is growing up with a dense growth of underbrush of no value whatever. The burnt area is mostly in the north-east corner. The pine, spruce, etc., in this township are very valuable.

3 F. This township has been nearly all burnt over by a fire which occurred about forty years ago. The southern portion contains no timber of any value except an occasional clump of trees that escaped the fire. Along the north boundary there is a good growth of timber of considerable value. West of the Aubinadong River there is some good pine and spruce. There is also a fair quantity of spruce with pine scattered throughout on the east side of the Aubinadong River. On account of the ravages of fire, however, this must be considered a poor township, although what timber there is appears to be of good quality.

4 F. Very little of this township has been damaged by fire, there being a small area on the east side and another on the west side having an area of about three square miles in all that has been burnt. The remainder contains pine, spruce, balsam, cedar and birch. There is a large quantity of pine in this township and the spruce is plentiful and good. This is a very fair township.

5 F. The northern part of this township has been burnt over and about forty per cent. of the total area has been fire swept, only an occasional clump of green timber having escaped. On the remainder of the township the timber is very valuable. White pine and spruce occur in large quantities and the other timber common to the country is very much in evidence. This is a very good township in spite of the damage done by fire.

196 and 202. Only the line between these townships was run, so that it was possible to obtain very little information regarding these two townships. The line runs through a good growth of mixed timber containing much pine and spruce for three and a half miles south from O.L.S. Niven's Base Line, which was crossed near the 84th mile. From three and a half to five miles there is nothing but

second growth, birch and poplar, this area having been burned over about forty years ago, and the fire appears to have run for a long distance east and west of the line and probably belongs to the same area of brulé which crosses 3 F and 3 G, as the growth appears to be of about the same age. From the Garden River, which crosses near the fifth mile to the north boundary of Townships 195 and 201; the timber is mostly maple and birch of poor quality, with considerable pine, spruce and cedar scattered throughout.

3 G. This township has been badly damaged by fire. Fully sixty per cent. of the area has been burnt over some forty years ago. The northern portion of the township has escaped, but the timber is largely hardwood of poor quality. There is considerable pine, spruce and cedar throughout, increasing in quantity towards the north-east corner of the township. Taken as a whole this is not a good township.

4 G. A small area of brulé exists on this township along the canoe route from the Aubinadong River to Aubahagama Lake. It covers probably three square miles. Otherwise the timber has not been damaged and in some parts is very valuable. North of Aubahagama Lake there is a very large amount of valuable pine and spruce, although the pine is not noticeable from the lake, as the timber immediately surrounding the lake is largely white birch and hardwood. South-east of Aubahagama Lake there is considerable maple and birch of inferior quality, with pine and spruce throughout. Near the south-east corner of the township there is a considerable quantity of white pine to be seen from the lines. Probably one quarter of the area of this township is water, as two large lakes, Aubahagama and Saymo Lakes, are probably within its limits. This is a very good township, especially the north half.

5 G. The north-east corner of this township has been burnt over about fifteen years ago. Otherwise the township is very valuable. The north-west corner of the township has a fine growth of pine and spruce and elsewhere throughout the unburnt portion of the township both pine and spruce occur in large quantities. This is a very valuable township.

3 H. A considerable portion of the south-east corner of this township has been burnt and contains no timber of value. There is a large amount of hardwood on this township, but the quality is poor. There is a large amount of spruce, balsam, cedar, etc., and considerable pine scattered throughout. This township is not nearly as valuable as others within the limits of the survey.

4 H. There are two small areas of brulé occurring on the west side of the township, otherwise there is a good growth of timber. The best pine seen occurs along the north boundary and the quantity is large. In the southern part there is a great deal of white and yellow birch and maple with balsam and spruce. There is scattered pine throughout, but the quantity does not appear to be large. The northern portion of this township is very good, but the southern part is much less valuable.

5 H. This is a very valuable township. It is practically undamaged by fire and the timber growth is very heavy. White pine is very plentiful along all the boundaries of the township and in the north-east corner it is particularly valuable. Much fine pine could be seen from the south boundary as well, and as far as could be seen during the progress of the survey, pine is fairly well distributed over the entire township. There is also a large amount of very fine spruce, balsam and birch. Taken as a whole, this is the best township within the limits of the survey.

T'p- 22, R- XI. This township has been touched by fire in three places and the area burnt appears to be about five square miles. There is a large amount of maple

and birch of poor quality, with pine, spruce, balsam and birch distributed throughout. There is a large amount of pulpwood on this township, and some good groves of pine, but it is not nearly as valuable a township as others seen during the season.

T'p- 22, R- XII. This is a very good township. Along the east boundary there is a good growth of pine and spruce, also along the south boundary. In the north-west corner there is a heavy growth of pine, and, in fact, more or less pine can be seen all over the township wherever an extended view could be obtained. There is also a large amount of pulpwood and considerable hard wood. This appears to be one of the best townships seen during the season.

T'p- 23, R- XI. As this township is now being lumbered by the Algoma Commercial Company, I do not consider it necessary to report. I may say, however, that the east and north boundaries of this township were run some years ago, presumably under the directions of the Algoma Commercial Company. These lines do not coincide with the lines run by myself under instructions from your Department. I have, however, connected these lines with my survey, and their location is shown on the plan by a dotted line.

T'p- 23, R- XII. There is some good pine along the south boundary of this township, especially for a mile and a half east of the Goulais River. The east boundary passes through some good pine scattered among spruce and hardwood. There is a good grove of red pine near the small lake at the north-east corner. Along the north boundary there is not much pine to be seen. There is a large quantity of fine spruce and white birch, with some very large cedar west of the Goulais River, although not much pine can be seen from the lines, there is some very fine pine inside the township. Outside the limits of the survey there is some very fine pine north of Townships 5 G and 5 H.

Geology.

The prevailing formation in Laurentian. The country drained by the Mississaga and Aubinadong Rivers and their branches is composed of Granite, Gneiss and Syenite, intersected by numerous dikes of fine grained Trap. A large number of these dikes were examined, but no signs of mineral were found in any of them. The contacts between the dikes and the country rock were invariably tight and devoid of vein matter in any form. Around Aubakagama Lake and on some of the islands in the same Huronian rocks occur. These consist chiefly of diorite and a form of slaty schist. In the valley of the Goulais River and its branches Huronian rocks are more in evidence, although they appear to consist mostly of various eruptions in a Granite formation. Owing to the heavy growth of underbrush and moss the rock exposures are not as frequent as the rough nature of the country would lead one to expect. The only place where frequent exposures were to be seen was in the large brule, which occurs up the Aubinadong River. Here the formation is all Granite with numerous trap dikes, as already stated. The country is very rough and exceedingly difficult to travel in. The rock ridges appear to run in all directions with very few valleys that continue for any distance in one direction. In addition to the rock ridges there are numerous hills of boulders and gravel of glacial origin.

There is practically no land fit for agricultural purposes.

Water and Water-Powers.

A reference to the plan will show the various river systems better than can be done in a written report. However, I may say, that the eastern part of the territory is drained by the Mississaga River and its tributary the Aubinadong River, with its two main branches, the East and the West. The Mississaga River is a large stream, from four to six chains in average width. Within the limits of the survey occur numerous small falls and flat rapids, as well as the famous Aubrey Falls. Here there is a total fall of over one hundred feet and a magnificent water-power could be developed. I understand that the Hydro-Electric Power Commission have already reported on this power. It is doubtful if the other falls and rapids below Aubrey Falls could be used for water power purposes. Just above O.L.S. Niven's Base Line, a long series of continuous rapids commences, which extends as far south as Squaw Chute in the Township of Haughton, a distance of over thirty miles. These rapids can all be run by skilful canoemen, but the numerous boulder and gravel flats in the river bed will make the driving of timber an expensive matter.

The Aubinadong is a swift, rough stream, flowing over beds of sand and gravel. It is about one hundred feet wide where it joins the Mississauga River. No portages occur from this point, until about two miles south of the north boundary of Township 4 F, where a portage of about eight chains occurs on the east side of the river. Below this portage, however, it is necessary to pole a canoe almost the whole distance, making travel up stream very slow and tedious. Above the forks in the Aubinadong the East Branch contains no heavy falls, but there is a long series of shallow flat rapids which must be poled up. The West Branch is much rougher. A falls of at least fifty feet occurs about a mile north of Township 5 F, where a good local power could be developed, but the quantity of water is not large in the dry season. Both branches of this river could be used for driving timber, although considerable improvements in the way of cribs, slides, etc., would be required. The West Branch is worse than the East in this respect. At the head of the West Branch, however, there is a large lake crossed by the north boundary of the Forest Reserve, where an abundant supply of water could be stored for timber driving or water-power purposes.

The Garden River takes its rise in Saymo Lake. It is a stream nearly a chain wide where it leaves Aubakagama Lake, and flows with a swift current over sand and gravel bottom. Abundant water for timber driving purposes could be stored in Aubakagama and Saymo Lakes.

The Goulais River and its branches drain the whole of the territory west of the Mississaga Forest Reserve and also parts of Townships 4H and 5H. The Goulais River is a large stream with a fast current and numerous rapids. When crossed by the north boundary of Township 23, Range XII, it is about two chains wide, with very little current. About a mile below this point there is a considerable fall where a fair power could be developed.

Aubakagama Lake is the largest body of water in this region. It is a beautiful body of clear water with numerous islands. Saymo Lake, Mashamoga Lake and Sisabie Lake, are also considerable bodies of water. In the northern part of Township 5 G there is a fairly large lake which drains to the West Branch of the Aubinadong. There are also some fairly large lakes in Township 5 H, which run to the Goulais River.

Fish and Game.

This section of the country would form an ideal resort for tourists. All the lakes mentioned above abound in speckled trout of large size. The Goulais and Garden Rivers, with their branches, are splendid trout streams. Aubakagama Lake has both speckled trout and grey trout. Moose, deer and wolves are very plentiful. Fresh beaver work was seen in many places, and marten and mink are plentiful. This country does not appear to be much frequented by trappers.

The magnetic variation averages about three degrees, forty minutes west, but in a number of places there is a great deal of local attraction. Wherever any pronounced local attraction occurred the particulars were noted in the field notes.

Astronomical observations were taken wherever possible and the details entered in the field notes.

Enclosed herewith are field notes, plan and timber plan, also account in triplicate, all duly attested.

I have the honour to be,
Sir,
Your obedient servant,
(Signed) James Dobie, O.L.S.

The Honourable, the Minister of Lands, Forests and Mines,
Toronto, Ont.

Appendix No. 20.

Survey of Township Outlines in the Mississaga Forest Reserve, District of Algoma.

Orillia, January 26th, 1910.

Sir,—Pursuant to instructions received from you bearing date of the 25th day of May, 1909, for the survey of Township outlines in the Mississaga Forest Reserve, in the District of Algoma, we proceeded to make such preparations as were necessary to enable us to carry out the work outlined therein, and on June 24th following our canoes left Biscotasing for the journey south. The route followed in reaching the site of the work was up the Spanish waters, through Canoe Lake, and over the divide into the waters of the Mississaga, passing through Upper Green Lake. This route is a good one, having comparatively few obstacles to travel and being composed mostly of lakes, but owing to its tortuous character is somewhat lengthy in comparison with the straight line course. The portages were found to be well travelled and in good condition. Not being familiar with this part of the country and not having been fortunate enough to secure any one who had been previously over the route, travelling was perhaps a trifle slower than would have been the case had we been possessed of an experienced guide, as there are many water stretches along the way which open out invitingly and seemingly beckon the traveller from the narrow but not at all straight paths that lead to the main river stretch of the Mississaga. We successfully avoided these enticing byways, however, and arrived at the crossing of O.L.S. Niven's first merid-

ian on the Mississaga River on the 30th instant. Here we divided our party, sending some down the river with supplies and with the remainder packed down Niven's meridian to the post at VI. M. and there commenced our first base line west from that point.

Owing to cloudy weather conditions we were unable to procure an observation at the above starting point and were forced, upon this account, to carry the line on by using the line run east from the same point as a basis to obtain bearing. It was not until we had run about four miles in this way that an observation could be procured, and then the line was found to be bearing twenty-three minutes too far to the south. At the IV. M. post the line was deflected to a course due west, and thereafter observations were secured at each meridian intersection and the back checks in all cases were found to be satisfactory. At the measured points of six miles, twelve miles, eighteen miles and twenty-four miles on the base line meridians were turned north and south, those running south ending at the base line run by O.L.S. Niven in 1902, and their northerly continuations being carried to their intersection with our second base six miles to the north of our first base line. A peculiar accident in regard to this first base line is the manner in which it intersects the meridian run by O.L.S. Niven thirty miles west from our starting point, the base line coming out only one and one-half links to the north of the iron post planted on this meridian at VI. M. The second base line was commenced from the chained distance of six miles north from the first base line measured on the fourth meridian, and run west to Niven's meridian of 1902, and *east* to the meridian passing through our starting point, for the first base. Wooden posts were planted on both base and meridian lines, with the mileage marked from I. to V., dating on the base lines from the meridian to the east, and on meridian lines from the base line to the south. In cases where the mileage points fell in a lake or other position unsuitable for planting a post, posts were planted at the nearest suitable point and marked with the distance dating as aforesaid. At all intersections of base and meridian lines, or as near such intersections as circumstances would permit, with the exception of the intersection of the second base line with Niven's meridian of 1902, forming the north-westerly angle of Township 4 D, iron posts were planted marked with the names or designating numbers of the adjacent townships. Wooden posts were also planted alongside these iron posts. The extremely rough and precipitous nature of the country passed over by these lines renders accurate chaining impossible and always liable to error. The transit can work within much narrower limits of error than can be assigned to the chaining and we are of the impression that more accurate work could be done by using instrumental measurements from one transit station to another to determine intersection points than by ordinary chaining. The lines were well blazed and cut out for long sights from hill-top to hill-top, where station pickets were planted firmly and rock mounded where necessary, so that exact line points could readily be picked up if required in the near future.

Topography.

The country traversed by this work is generally of an extremely rough and hilly character, level ground being of rare occurrence and unimportant in extent. There appear to be no well defined ridges, the surface being almost wholly occupied by more or less rounded hill masses, often presenting a precipitous face, and rising from one to three hundred feet above the valley-like depressions surrounding their bases. No matter in which direction one travels, if a straight line be fol-

lowed, the same continuous succession of hill after hill is encountered. Owing to the dense forest growth, views of any wide extent are not usual, but in some instances, especially along the second base line where the line enters the fire area, a wide sweep of country could be seen and its general character observed. These hill masses are so tightly packed together that in many instances the lakes present so attenuated an appearance as to be at first sight mistaken for rivers.

Water Areas.

The main drainage of the area considered is through the Mississaga River and its main tributaries the Abinette and the Wenebegon. The Mississaga enters this area from the east, crossing Niven's first meridian flowing in a south-westerly direction, at a distance of about 1¼ miles southerly from the north-easterly angle of Township X, thence it turns north-westerly, crossing the north boundary of said township about ten chains east of the 11 M. post and looping back again at 111 M. the base line crossing at the latter point just above Hanging Stone Chute. It's general character in this stretch is that of a narrow lake-like expansion with only moderate current. From Hanging Stone Chute the course of the river is south-westerly, crossing, paralleling and recrossing the south boundary of Township X. in a flat loop near the south-westerly angle of said township. This stretch has fairly strong current and numerous rapids. At about fifty chains west of the meridian boundary of Township X and 4 A, the river takes a north-westerly course through a marshy flat to its junction with the Abinette, the latter river entering from the north at a point about two miles south from the centre of the north boundary of 4 A. The course through this marshy flat is tortuous and the current swift. From the Abinette the river turns slightly south of west, passing a large island in its course and crossing the meridian boundary between 4 A and 4 B at about 2¾ miles. Rapids occur at the island, the notherly channel being used as the canoe route. From the boundary 4 A, 4 B, the general trend is slightly north of west till Green Lake is reached. This lake has an extension north-easterly and south-westerly of about 1¼ miles by about ¾mile and touches at its westerly extremity the meridian boundary 4 B and and 4 C. It lies almost completely north of the river channel, the latter flowing through it but a short distance along its southerly shore. One fall occurs on the last mentioned stretch at about ¾ mile westerly from the boundary 4 A-4 B, and is avoided by a portage on the south bank. From Green Lake the river takes a southerly dip, crossing the meridian 4 B-4 C near 2¾ mile from here after passing the falls on a westerly course at about a mile west from the said meridian, the river widens and enters the eastern extension of Lake Minnesinaqua, a considerable body of water extending across Township 4 C and the south-westerly corner of 4 D. The river again debouches at 1½ miles on a southerly course across the base line on the southerly boundary of 4 D and turns westerly, crossing Niven's second meridian at a distance of about a mile south of the south boundary at 4 D, thence northerly again, crossing the meridian to the east, flowing directly along it for some distance and finally turning west at Aubrey Falls. The Wenebegon enters from the north about a mile south from the base line and a quarter of a mile east from Niven's meridian just below a bad rapid on the Mississaga. The water of the Mississaga is clear and dark, carrying little sediment and flowing usually over a sandy or gravelly bottom. With few exceptions the valley is narrow and hedged in by rugged hills. Owing to the lack of rain during July and August the water in this as well as its tributary streams was very low, so much so that our party readily crossed dry shod on the stones at

the head of Hanging Stone Chute late in September, and the shallow water on the rapids sometimes necessitated light loading the canoes. The second base line crossed the Abinette River about two chains above the head of a falls of about five feet, and this also was crossed by walking on the stones. This latter river is about one chain and seventy-five links wide at this point and flows through a level flat of about half a mile in width where crossed by the base line. This flat is sharply bounded where crossed by this base line on its easterly side by a vertical wall of rock about thirty feet in height and forming a remarkably straight line to the north. The Wenebegon River is crossed by the first base line at V. M. where it is one and a quarter chains in width with a moderately swift current, has clay banks extending about four feet above low water, and is turbid. The channel is here very crooked and flows through a marshy flat of nearly half a mile in width which is apparently all overflowed at the high water stage of the river. Back of the river rim the ground rises a few feet above the marsh for a distance of two or three chains, forming a fringe of small elm, black ash and alder. This stream is important as traversing the main pine area in the district covered by the survey. As we did not, however, have a canoe on this river we are unable to describe its character between the first and second base lines, the latter of which it crosses between IV. M. and V. M. north of 4 D. Numerous smaller streams traverse this area, draining into the Mississaga or, in the southerly part, into the branches of the White River, some of which will doubtless form valuable adjuncts in carrying out future lumbering operations.

The chief lake area is the Minnesinaqua, already mentioned, a fine body of water with numerous sand beaches and well timbered shores on the south, and containing a number of well-wooded islands. One of the latter is crossed by the meridian line 4 C-4 D in the narrow part of the lake, and the base line crosses near its southerly extremity, the southerly bay of the lake, between mileage V. M. and VI. M. 4 C. The whole country surface is dotted by smaller lakes of greater or less extent, many of which are crossed by the lines. A somewhat large lake crossed by the second base line between I. M. and III. M. on the north boundary of 4 D contains an island crossed by the line which presents a peculiar appearance, having been cleft so deeply from the north as to be almost cut in two. A considerable chain of lakes also extends southerly from the Mississaga, following closely along the third meridian and form a fairly well travelled canoe route to the south. This canoe route commences by a portage of about a mile leaving the Mississaga a short distance west of the meridian 4 B-4 C and crossing the first base line about one and a half miles west of the first meridian. Another canoe route apparently of less importance, leaves the Mississaga up the small marshy creek entering just south of first base line and a short distance east of the first meridian, 3 A-W. Canoe trips are also made north from the Minnesinaqua through Round Lake, but as we did not have any very definite information regarding the location of the latter lake, and the creek entering the former lake was found to be too shallow for loaded canoes, we found it preferable to pack over the lines. Numerous portage trails intersect the country, but are apparently only travelled by the Indians on their hunting expeditions, are poorly marked and not nearly so well travelled as the trails made by the moose.

Timber.

Almost the whole of this area shows the effect of destructive fires at dates more or less remote. That part lying north of the Mississaga River and east of the second meridian appears to have suffered worst in this respect from recent

conflagrations, the forest here showing an average growth of from twenty to thirty years. Much of the country south of the river and over the whole area shows streaks and patches, sometimes of considerable extent, of brulé of the above character. In many places through this brulé, which contains a thick growth of spruce, jack pine, white birch and balsam and to a lesser extent of tamarac, seedlings of white and red pine are beginning to gain a foot-hold, and will doubtless, if properly protected, again gain the supremacy once held by this species in the forest growth. South of the river and west of the second meridian the country is largely occupied by timber of larger growth and of the same species mentioned above. Next to the white and red pine, the jack pine probably stands first in importance and much of this is fit for lumber and ties. Some fine timber of this latter species is to be found along the meridian boundary of 3 A-3 B, tall straight trees of a diameter extending to 18 inches. Timber of the same character is plentiful on the first base line westerly from II. M. 3 B to the lake at the meridian intersection and southerly along the meridian 3 B-3 C to the lake at III. M.; and also in the tract cut by the first base line west from II. M., 4 C to Lake Minnesinaqua. Again along the meridian 4 C-4 D, northerly from IV. M., a similar quality of jack pine is met with. Associated with the jack pine in the larger timbered area there is a considerable quantity of spruce running to 14 inches in diameter and also some white poplar. White birch, though much in evidence, seldom exceeds ten or twelve inches in diameter, and does not appear to be of much commercial value. Balsam in many places forms a thick undergrowth, and thickets of moosewood and hazel serve effectually to screen any object more than a few feet away. Scattered red pine and white pine up to 24 inches in diameter, in about equal proportions, are met with from mileage 1 to 3½ on the north boundary of Township W, and also in small bunches and scattered trees along the westerly boundary of the same. It would appear that this township would afford sufficient pine to render lumbering profitable. Again, along the northerly boundary of 3 C, extending from III. M. to Lake Minnesinaqua there is a good sprinkling, chiefly of white pine, ending in a thick pinery at the shore of the lake. Along the meridian forming the boundary 3 C-3 D, pine, scattered or in small bunches, is also met with. Scattered trees also occur in the area lying between the southerly shore of Lake Minnesinaqua and its river outlet and the first base line. There is scattered pine in considerable quantity along the meridian line 4 C-4 D from IV. M. northerly and westerly along the second base line to the large lake at I. M. 52.51 chains. Travelling east along the second base line scattered trees and small blocks are met with at intervals as far east as III. M. on the north boundary of 4 B. By far the most important pine area passed through, however, lies adjacent to the Wenebegon River in the westerly part of Township 4 D. This area is entered on the first base line at about III. M. on the south boundary of 4 D and continues with slight interruptions across Niven's second meridian, forming the westerly boundary of the said town-ship. On the second base line this area is entered at IV. M. about half a mile east of the Wenebegon and continues across the west boundary of 4 D. Streaks and patches of burn cut this tract, but it still presents a fine appearance of almost solid pinery, and from the second base, where a good view could be obtained to the south, it extended as far as the eye could reach. The average of the pine seen in this block would appear to run about 14 logs to the thousand, and the timber of good quality, sound and generally free from defects, with the exception of a little stump rot. The white pine would probably average well over 60% of the whole. The Wenebegon, cutting the tract centrally, leaves little to be desired in the way of transport for the logs.

A fire area of so recent date that little growth has yet been made was passed through, apparently near its southerly edge, by the first base line. Commencing just west of the second meridian bounding 4 A-4 B this tract continues for nearly two miles along this base line and extends northerly to the Mississaga. It has occupied by a tangled slash of windfall timber very difficult to traverse and presents the usual desolate appearance characteristic of such a condition. There was also a fire of considerable proportions raging north of the Mississaga in the early part of the summer, dying out probably in August. This was confined mostly to the brulé country, and would appear, from such observations as we could make, to have worked from the river northerly to a short distance beyond the second base line. From several hill points on the latter line its northerly limit could be seen in rounded patches of burn in the otherwise green country. The greatest continuous distance passed through in this burn by the lines was on the second meridian, 4 A-4 B, from a short distance south of IV. M. to the second base, with slight interruptions. This fire was not in the nature of a clean sweep, but of the usual patchy character, leaving green areas surrounded by burn. In some places it was severe enough to form a slash, but generally the trees were simply fire killed. This burn also extends along the second base line at intervals in streaks and patches from V. M., 4 A to the westerly side of the lake at V. M., 4 B. The remarkable recuperative powers of the forest growth were well evidenced through this fire area, as when our second base line was cut through it in September, less than two months after the fire, there was found to be a lusty growth of young birch and poplar more than eighteen inches high rising from the blackened ground.

Soil.

Speaking broadly, the district is devoid of agricultural possibilities, the thin soil covering the rocks being merely the pulverized sand of the rocks themselves, and the very few exceptions to the rule are contained within very narrow limits of area. A flat of inconsiderable extent is crossed by the third meridian, 4 B-4 C, and extends from about seventy chains south of the Mississaga to the river itself. This flat contains clay alluvium and is covered with small poplar, tamarac and willow. A level, sandy plain covered with small jack pine extends from the creek at 59.59 chains on the 4th meridian, 3 C-3 D to about 2¼ miles. The above are the most notable exceptions met with and will serve to illustrate the general character of the country as regards its soil constituent. Its one great use is apparently as a nursery for timber growth.

Rocks, Minerals.

From force of circumstances little time can be devoted to the study of rock formations when conducting survey operations. The country, however, is generally overlaid by grey or pinkish rock of granitoid texture, apparently granite of massive structure. This rock weathers to a light grey, or nearly white, and the rectangular cleavage characteristic of the granites was noticeable in many places, the rough blocks lying about the surface, or easily detached from neighboring rock faces, being found most convenient for cross piling about the station pickets in exposed places. There appears to be little or no mica associated with the quartz and feldspar of these rocks, but it contains a dark mineral constituent which is probably hornblende. Numerous greyish or greenish black dykes of trap or diabase are found cutting through the granite, and these were especially numerous

across the burnt section on the second base line between I.M. and II.M., 4 C., running from a few inches to a foot or more in width. Conglomerate outcrop was also reported on the hillside rising from the westerly shore of the first lake crossed by the 2nd base line westerly from the 4th meridian or at mileage IM. 30 chains north boundary, 4D. These rocks appear to be barren of minerals of economic importance. A little specular iron was met with in narrow seams or gashes along the first six miles of the first base line. A milky quartz vein about three feet wide in red coarsely crystalline rock, with a strike north-easterly and south-westerly, occurs on the 2nd base line about eight chains east from the north-west corner of 4C., and it was again found twenty or thirty chains southerly from this point and east of the 4th meridian, when cutting across the rough hills of this locality. A cursory examination did not expose any metallic minerals in this quartz. Another quartz vein of similar character to the above, and about 18 inches in width, was crossed by the second base line on the westerly slope of the hill descending to the easterly shore of the lake cut by the line at V.M. 36.29 chains on the north boundary of 4A. This latter vein does not appear to be mineralized.

The compass seldom shows any marked variation from a mean declination of 5½ degrees west, and is remarkably steady in alignment for a region of this character. This mean was obtained as the average of a large number of observations.

Game—Fur.

Large numbers of moose frequent this section and could be seen almost any day during the hot weather along the rivers and small lakes. The trails of this animal are everywhere through the woods, leading usually from one lake to another or to the river, and so well beaten that were it not for the absence of axe marks they might be mistaken for well travelled portages. In the northerly part, and especially on the brule section east of the 2nd meridian, red deer are also plentiful. The thick nature of the bush, however, gives little opportunity to see the animals themselves, but on one occasion a doe evidently with fawns close by came within a few feet of the tents when several members of our party were in or about them, and showed no signs of alarm. Signs of bear are abundant, and occasionally the fiendish music of the wolf packs strikes the ear with its unwelcome sound. Abundant indications of the one-time abundance of the beaver are present, but only in a very few places along the easterly part of the 2nd base line were the animals found to be present. Their number appear to have been almost decimated over this region. Little signs of the smaller fur-bearing animals were met with, although the country appears to be regularly hunted by a number of Indian families, as the winter camps of these people were observed in several places.

We have the honor to be,

Sir,

Your obedient servants,

(Sgd.) Cavana & Watson.

The Honourable the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 21.

SURVEY OF OUTLINES OF TOWNSHIPS IN THE MISSISSAGA FOREST RESERVE, DISTRICT OF ALGOMA.

LITTLE CURRENT, ONT., December 1st, 1909.

SIR,—I have the honor to submit to you the following report on the survey of the outlines of Townships 1A, 1B, 1C, 1D, 1E, 1F, 2A, 2B, 2C, 2D, 2E and 2F, in the Mississaga Forest Reserve, in the District of Algoma, under instructions from your Department, dated Toronto, May 25th, 1909.

Proceeding by the way of Wenebegon Siding, on the main line of the Canadian Pacific Railway, and by the Kapuskasing River, from the height of land, thence into Wenebegon River route to the Mississaga River, we arrived at our starting point on the 29th of July.

Agreeable to instructions, I commenced the work by running south, astronomically, 6 miles between townships 2E and 2F, from O.L.S. Niven's 72-mile post on his base line of 1902; thence west astronomically between 1F and 2F to intersect the line which I ran from the 78-mile post on the said base to form the west boundary of Township 2F; through an error this line is not due south. This line was produced 75 chains and 74 links to intersect the north boundary of township 195. I then continued south between 1E and 1F from my 6-mile corner on the meridian from the said O.L.S. Niven's 72-mile post 6 miles, 58 chains, 30 links, to intersect the north boundary of Township 188.

Returning to the said six-mile corner, I ran east astronomically, a base line between 1E and 2E, 1D and 2D, 1C and 2C, and 1B and 2B, 1A and 2A, to intersect P. L. S. Herrick's line of 1857. At intervals of 6 miles and 77 links on above base line, I ran north to intersect the said O. L. S. Niven's base, and south to intersect the north limits of Townships 182, 176, 169 and 163.

I reopened and reblazed the Herrick line on the north side of my base line 5 miles, 45 chains and 70 links, to his 18-mile post, and on the south side of it 6 miles, 38 chains and 23 links to the north-east angle of Township No. 157, which is identical with the south-east angle of Township 1A. Mile posts were also planted on the Herrick's line. O. L. S. Niven, it appears from notes supplied me, has produced the Herrick line to connect with his base of 1902.

At every mile a wooden post 6 inches square was planted and marked in Roman numerals, cut with a knife; the mileage reckoning from the east boundary of the township on the base line, and reckoning from the north boundary of each township on the meridians.

At each township corner an iron post made from pipe 1¼ inches in diameter was also planted, and cut thereon with a cold chisel the township numbers on the sides facing the respective townships. The wooden posts at the township corners were similarly marked. Where a mile came in a lake a post was planted on the shore and marked thereon the miles and chains. Two bearing trees were marked and noted at every post.

The lines were well cut out and blazed on the side of the tree facing the line, also on the sides facing the direction of the line.

The lines were run with a Solar compass carefully adjusted.

The country is very rough and broken in many places, and generally is rolling and hills from 40 to 400 feet high. There is very little level country, and practically no swamp.

The rock is principally granite, intermingled with serpentine and conglomerates.

The soil is a rich, sandy loam and gravel, but so broken with rock and boulders as to be unfitted for anything but timber.

The Mississaga River and its tributary, the White River, and its many branches run through the townships, and afford excellent capacity for driving logs and other timber. The streams all run swiftly, but no falls sufficient for large water power were met with.

Lake Kirkpatrick is a beautiful stretch of water about 6 miles long and from ½ mile to 1½ miles wide. The Indians call it Anuminabing, which comes from anumina, the Indian word for Vermilion paint, which the Hudson's Bay Company sold to them.

The timber is white and red pine, jack-pine, white spruce, white birch, balsam, poplar, cedar, black birch, maple, black ash, small tamarac and black spruce.

The white pine is from 12 to 36 inches and the red pine from 12 to 28 inches in diameter, and is mostly of good quality. There is considerable of it in all the townships, except in the brulé portions. In a few places the white pine is scrubby, but of fair size. The greatest amount of pine to the acre was found along the north boundaries of 1C and 1D. From a mountain on the south side of Lake Kirkpatrick a splendid view of the country was obtained to the north, north-east and north-west, and showed great areas of pine in those directions. From some estimates taken the cut of pine would, in many places, average from 10 to 20 thousand feet, board measure per acre.

An average of about one-third of the northern portion of each of the townships, 2B, 2C, 2D, 2E, and the south-east half of 1A, is an old brulé and appears to contain little merchantable timber. There is some fair-sized scattered pine through it which has survived the fire.

The fire of May, or early June, this season is said to have come from the north down through 2D, and extends also for about from one to two square miles in each of Townships 1D and 1C and 2C, but has done little or no damage to the white and red pine. It has, however, killed the other timber.

The jack-pine and white spruce is pretty evenly distributed, and except in the brulé is from 8 to 18 inches in diameter.

The cedar is of fair quality. The black birch and maple is found principally along the southern limit of the south tier of townships.

The country is an ideal one for the sportsman. Moose and red deer are found at nearly every lake, while a great many of the streams and small lakes are fairly alive with large speckled trout. The small lakes in the south-east corner of Township 2C are particularly noted for speckled trout. Wolves are very numerous. One Indian in our party shot several.

The chief guide of the party, John Undewawadin, a Biscotasing Indian, died suddenly while with us about the 14th of September, and was buried by some of the party, including his brother, Joe Wessigence, at the little graveyard on the east shore of Kin-di-og-a-ming Lake, which is about two miles north of the north-west angle of Township 2B. Lung trouble was apparently the cause of his death.

Great care was taken to extinguish all our fires.

Accompanying this report is the timber map, showing in colors the different areas of timber, also field notes, plan and account.

The canoe routes shown on the plan were drawn from careful sketches made while on the ground, and after ascertaining from the guides, as well as possible, those which I did not see.

I have the honor to be,
Sir,
Your obedient servant,
(Sgd.) T. J. Patten,
Ontario Land Surveyor.

Appendix No. 22.

Survey of Township Outlines, District of Algoma.

Thessalon, Ont., October 29, 1910.

Sir,—In accordance with your instructions, dated May 25th, 1910, I have completed the survey of certain Township Outlines in and adjacent to the Mississaga Forest Reserve, and beg to submit the following report:

I commenced the survey at the iron post planted by myself in 1909, at the north-east corner of Township 23, Range XII. From here I ran due north, astronomically, a distance of 12 miles, 1.60 chains, to the second base line run by me in 1908. At the six-mile post of this meridian line, I ran due west, astronomically, a distance of 6 miles, 3.80 chains, to the meridian line run by T. B. Speight, O.L.S., in 1898. Returning to the six-mile post mentioned above, I ran a base line due east, astronomically, as a continuous line, a distance of 30 miles, 42 links, to the meridian line run by A. Niven, O.L.S., in 1902. This base line crossed the second and first meridian lines, respectively, run by me in 1908. From a point six miles east of my second meridian line of 1908, a meridian line was run north, astronomically, to intersect my second base line run in 1908, and south, astronomically, to my second base line, run in 1909. From a point six miles east of my first meridian line of 1908 a meridian line was run both north and south to intersect the second base line run by myself in 1908 and 1909, respectively.

The meridian line run by A. Niven, O.L.S., in 1902, was produced north astronomically to intersect my second base line in 1908, and this base line was produced east astronomically a distance of 6 miles from the 12-mile post planted in 1908, the mile posts being marked from XIII. M. to XVIII. M., so as to make the numbering continuous on this line. At a point 1.51 chains east of the XVIII. M. post on this line, I intersected a line run during the present season at a point 81 links north of a post marked VI. M. As my instructions contained no reference to this line, and stated that I was to continue the second base line of 1908, as far as the 18th mile post, I did not plant a post at this intersection, but recorded the details in my field note-book.

A the end of every mile a substantial wooden post was planted and a bearing tree marked wherever possible. If stones were available a mound of them was placed around the post. When the end of a mile came in water, a post was planted on the nearest shore and the chainage marked on the post. The posts and bearing trees are all marked with a scribing iron, and all the details entered in the field notes. At each township corner the post was marked with the designation of the township, on the side facing the township.

Eight iron posts were planted, each one being at a township corner, except one, which was planted at the 18th mile post of the production of the second base line of 1908. Seven iron posts were unfortunately lost in a canoe accident on the Goulais River, and could not be recovered. Each township corner, however, except one, is either marked by an iron post at the corner, or else an iron post planted on a previous survey, is very close to the corner. The distance to each one of these posts from the corner is recorded in the proper place in the field notes.

Only one corner has no iron post nearer than six miles, and that is at the north-east corner of Township 23, Range XIII. Here a substantial wooden post was planted and a mound of stones built around it.

Throughout the survey, the lines were well cut out and properly blazed, and in all cases were run with a transit. Astronomical observations were taken whenever possible, and are recorded in the proper places in the field notes. Every precaution was taken to have the lines so well blazed and marked by stones piled around pickets and posts, that it would be practically impossible for any series of fires to entirely obliterate them.

The survey throughout was difficult, owing to the very rough nature of the country and the poor canoe routes. I had the great advantage, however, of having been over practically the same ground during the seasons of 1908 and 1909.

The country is well timbered with a mixed growth of spruce, balsam, white birch, cedar, jack pine and white pine. The white pine occurs more or less throughout the whole territory, but is more plentiful in the southern parts and appears to give place to large jack pine in the northerly parts. A large proportion of the territory covered by the survey has been burnt over in previous years. The timber plan, which accompanies this report, shows the limit of these burnt areas, as well as they could be estimated from the lines. A short summary of the timber resources of each township is given in detail.

Township 23, Range XIII.—There is a burnt area of apparently about 2,000 acres in the south-east corner of this township. The remainder is covered with a good growth of spruce, balsam, white birch, cedar and white pine, of good quality. The pine occurs in scattered bunches, while the amount of spruce available for pulp wood is very large. The Goulais River crosses the south-eastern corner of this township, while the small streams on the west side of the township run towards some other river, probably the Chippewa.

Township 23, Range XIV.—There is an area of about four square miles of brulé in the north-east corner of this township. The timber is very much the same as in the last township, while pine is scattered throughout, the best being in the north-west corner of the township. There is a large amount of spruce suitable for pulpwood. The greater part of the township is drained by branches of the Goulais and Chippewa Rivers, while the streams crossing the north boundary appear to flow towards the Batchewaung River.

Township 22, Range XIII.—There is very little burnt country in this township. The spruce is very valuable, and while pine is scattered throughout, being most plentiful along the east side of the township. This township is drained by the Goulais River and contains a number of fairly large lakes.

Township 22, Range XIV.—There is a considerable area of brulé in the north-west corner of this township. Spruce, balsam, white birch and white pine are the prevailing varieties of timber, the spruce being the most important. As in the township previously mentioned, the white pine is scattered. Nearly all of this township is drained by the Goulais River, although a branch of the Batchewauing River rises in the north-west corner.

Township 6H.—This township contains about a thousand acres of brulé along the north boundary near Goulais Lake. There is a large amount of good spruce, with balsam, birch, etc. There is a good growth of white pine in this township, the best being in the south-east corner and along the trail running south-east from Goulais Lake. This is the best area of white pine seen during the season. The township contains a few fair-sized lakes and is drained by the Goulais River.

Township 7H.—There are two large areas of brulé in this township. One is in the north-east corner and covers from 1,000 to 2,000 acres. The other is older and occurs east of Goulais Lake. It covers an area of about 5,000 acres, although the exact extent is hard to estimate. The pine in this township is scattered, and the best timber is spruce, which occurs in fairly large quantities along with balsam, white birch, cedar and jack pine. This township is drained by the Goulais River, although a few small streams on the east side flow towards the Aubinadong River.

Township 6G.—About two-thirds of this township have been burnt over. There is some very good white pine along the west boundary, together with spruce, balsam, cedar, etc. The west branch of the Aubinadong River runs through this township.

Township 7G.—The boundaries of the burnt areas in this township are hard to estimate, but fire appears to have run over at least two-thirds of the township, leaving scattered bunches of green timber here and there, but none of any great extent. Jack pine, spruce, balsam and white birch are the prevailing varieties of timber, with white pine scattered here and there. The best timber is in the north-east corner and along the west boundary. The west branch of the Aubinadong River runs through this township.

Township 6F.—Probably forty per cent. of this township has been burnt over, leaving only scattered clumps of green timber here and there. Along the west boundary of the township there is a large amount of jack pine, suitable for making railway ties, also a large amount of spruce, balsam and white birch. The white pine is scattered and the quantity seen from the lines is not large. The Aubinadong River and its branches drain this township.

Township 7F.—This township has been overrun by at least two large fires and one-half the total area has been burnt, if not more. There is some good white pine and large jack pine in the north-west corner. There is also a large amount of spruce, balsam and white birch, and this class of timber prevails throughout the unburnt portions of the township. The amount of jack pine of marketable size is very large. A tributary of the west branch of the Aubinadong River runs through this township.

Township 6E.—This township has also been overrun by fire, and probably one-third of the total area has been burnt. There is some good white pine along the Aubinadong River. Along the west boundary the prevailing timber is jack pine of splendid quality, with spruce, white birch, cedar and white pine occurring in fair quantities. The east branch of the Aubinadong River runs through this township.

Township 7E.—From thirty to forty per cent. of this township appears to have been burnt over. The best timber is jack pine, of which there is a large quantity. There is also much spruce, suitable for pulpwood, while pine occurs in small quantities scattered throughout. The east branch of the Aubinadong River runs through this township.

Township 7D.—Along the west and north boundaries of this township there is no sign of any visitation by fire. The timber along these lines is jack pine,

spruce, balsam, White birch, with scattered red and white pine. There is a large amount of jack pine of a size suitable for railway ties, and a considerable quantity of excellent pulp timber. The south and east boundaries of this township were not surveyed by me, and I cannot, therefore, speak of the timber along these lines. The west side of this township is drained by the Aubinadong River, while the streams on the east side appear to flow towards the Wenebegon River. As in previous years, little or no agricultural land was seen. The country is very hilly and in places almost mountainous, much broken with high granite ridges. There are also a great number of hills and ridges of gravel and boulders of glacial origin. In fact, the valleys are almost entirely filled with glacial drift.

The Goulais River and the branches of the Aubinadong River are the important streams. They are not very large, however, as in each case the streams rise very close to the limits of the survey. There are no water powers of any importance, although the rivers are all rough and rapid.

The prevailing geological formation is Laurentian, consisting of Granite Syenite and Gneiss ridges, much cut with dikes of diabase. No deposits of economic minerals were observed during the survey, although some claims have been staked for iron in the south-west corner of Township 22, Range XIII. These, I did not visit. In this section of the country, however, there are some areas of Huronian rocks and a few pieces of banded magnetite float were picked up along the lines. Townships 22 and 23, Ranges XIII. and XIV., might be worth prospecting for iron.

Moose, deer and wolves are plentiful, while frequent signs of all the ordinary fur-bearing animals were seen. Partridges were very plentiful, notwithstanding the fact that they had almost disappeared.

The Goulais River and the west branch of the Aubinadong River are full of speckled trout of very large size. The lakes tributary to these streams also afford splendid sport.

The Magnetic Variation averages about 3 degrees 50 minutes west.

Accompanying this report are a plan mounted on cotton; Timber Plan, Field Notes and accounts in triplicate.

I have the honor to be,

Sir,

Your obedient servant,

(Sgd.) James S. Dobie.

The Honourable the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 23.

Township Outlines, District of Algoma.

Little Current, Ont., September 15th, 1910.

Sir,—I have the honour to submit to you the following report on the survey of Township Outlines in the Mississaga Forest Reserve, in the District of Algoma, performed under instructions from your Department dated Toronto, May 9th, 1910.

Proceeding by way of Old Wakami Siding, mileage 94, west of Cartier on the Canadian Pacific Railway, I arrived on the ground the 27th of June and started the work by running north from O.L.S. Niven's 6 mile post at the south west angle of Township 7C, 12 miles 73 chains and 78 links to Lake Wenebegon.

Commencing again at the witness post 1 chain and 10 links north of O.L.S. Niven's 18th mile at the south-west angle of Township 6D, a continuous line was run due east astronomically a few chains less than 30 miles between townships 5D and 6D, 5C and 6C, 5B and 6B, 5A and 6A, Y and Z, and intersected the said O.L.S. Niven's meridian 1 chain and 62 links south of his 18 mile post at S. E. angle of Z. I might say that through an oversight this line was run from the above mentioned witness post instead of from the 18 mile distance at south-west angle of township 6D referred to.

From the intersection of this line which I ran east with O.L.S. Niven's meridian at 1 chain, 87 links north of his 6 mile post at the south-east angle of Township 6D, I ran south between Townships 5C and 5D 6 miles, 1 chain, 37 links to O.L.S. Watson's base line of 1909.

From each 6 mile corner on my base line running east above referred to I ran north and south to intersect at about 6 miles the said O.L.S. Niven's base line on the north and O.L.S. Watson's on the south. That between Townships 6A and 6B was run north to connect at about 3 miles O.L.S. Niven's 3 mile post on his meridian run south from the 18 mile post on his base line. The east boundary of 7C was run from a point on the north side of Moule Lake calculated 1 mile east from Niven's 11 mile post on his base line.

All lines were well cut out and blazed on the side of the trees facing the line, also on the side facing the direction of the line.

All lines were run with a solar compass.

At every mile a wooden post 6 inches square was firmly planted and cut thereon in Roman numerals the number of miles reckoning from the east or south side of the Township.

At every township corner an iron post made of one and a quarter inch iron pipe, three feet long, pointed and forged at the top was also planted beside the wooden post. The numbers of the Townships were cut on both these posts on the sides facing the respective townships. The wooden posts at these corners were set so that the lines pass through the angles of the post.

At every post where loose stones were convenient, a cairn was built around it and a record of such cairn made in the field notes.

Two bearing trees were marked and noted. The bearings of such are given from the post to the tree.

Wherever the end of a mile came in water, a witness post was planted on the nearest shore with the mileage and chains, plus or minus, marked thereon and duly recorded in the field notes.

TIMBER—Between 5D and 6D.

The timber on line between 5D and 6D is from 6th mile to 3½ miles, spruce, poplar, birch and jack pine to 15 inches diameter, with some good white pine scattered in places. The balance of the line is old brule with small birch, jack pine and spruce and occasional clumps and scattered white pine.

Between 5C and 6C.

From the north-west angle of 5C on line between 5C and 6C to 7 mile Lake, there is considerable white and red pine of good size and quality. From 7-Mile Lake to the 3 mile post it is old brule with small birch, jack pine, poplar and spruce. From the 3 mile post to north-east angle of 5C it was burned last season with very little timber remaining.

Between 5B and 6B.

This recent burn continues 4½ miles east along line between 5B and 6B, the line then enters green jack pine, poplar, balsam, birch and spruce, principally from 6 to 12 inches in diameter and continues in the same timber with addition of black spruce through the balance of this 6 miles and along line between Townships 5A and 6A and Y and Z to Niven's meridian.

Between 5A and 6A and Y and Z.

At the 3rd mile between Y and Z there is a new burn of about three-fourths of a mile.

On meridian between 5A and Y and 6A and Z.

On the meridian between 5A and Y and 6A and Z the timber is the same as just mentioned, green jack pine and black spruce, birch, balsam and poplar from 6 to 12 inches in diameter. In some places the jack pine is found to about 15 inches.

On meridian between 5A and 5B and 6A and 6B.

This same timber continues along meridian between 5A and 5B and 6A and 6B to a little past the 1st mile on latter line. It then changes to old brule with small jack pine and birch, which continues to O.L.S. Niven's post at 3 miles on north side of Rainy Lake.

At the southwest corner of 5A there is about 1 or 2 square miles of new brule which extends west into 5B.

Between 5B and 5C.

On the meridian between 5B and 5C going north the line for the first 3 miles runs through jack pine and white spruce, balsam and cedar to 15 inches diameter. There is some white and red pine in first mile and considerable large white and red pine in the third mile.

Near the third mile the line enters the newly burned country with very little timber and continues in it to end of 6 miles, and on to near end of fourth mile on line between 6B and 6C.

Between 6B and 6C.

In the 2nd mile on line between 6B and 6C there is about half a mile of green bush. From 4th mile to Moule Lake the timber is green jack pine, spruce, poplar and birch to about 12 inches diameter.

East limit of 7C.

Continuing north this timber is found on east limit of Township 7C. On 2nd and 3rd miles there is some scattered white pine.

On meridian between 5C and 5D.

On the meridian between 5C and 5D the line is in large green cedar birch, spruce and poplar for the first 47 chains going north. It then enters old brule with timber mostly small birch, poplar, spruce, jack pine, with occasional clumps of large timber which has escaped the fire.

These clumps continue for about 1½ miles. The balance of the 6 miles is in old brule with small timber. In many places on this 6 miles and on both sides of 7-Mile Lake, there is considerable white and red pine of good quality and from 10 to 24 inches in daimeter, which has survived the fire.

Meridian between 7C and 7D and north to Lake Wenebegon.

On the meridian between 7C and 7D the first mile is in old brule with small jack pine. It then enters green jack pine, birch, poplar and spruce to about 12 inches diameter. This timber continues to end of 6 miles and on north to about 3¼ miles in next line. It then enters the old brule again with small jack pine, birch and spruce, which continues to Wenebegon Lake. Along this 13 miles there is scattered white pine of good size.

To the south and east of Wenebegon Lake there is considerable large white pine of good quality in the old brule.

The black spruce in Townships 5A, 6A, Y and Z will run from 5 to 10 cords per acre of pulpwood in most of the swamps. There appears to be a larger percentage of swamp in these townships than in the others. Probably 10 per cent. of the area is swanp.

I have shown as accurately as possible on the accompanying timber map in colors the area of the different timbers.

The country is mostly rolling with occasional hills from 40 to 100 feet high. The soil is all a rich sandy loam, but so broken with rock and boulders that it is unfitted for anything but timber.

The rock is all red granite. In places small deposits of iron pyrites were observed.

The magnetic variation is principally from 3 degrees to 6 degrees west. The mean of a great number of readings shows 4 degrees, 40 minutes west.

The only considerable water power met with is on the Wenebegon River in Township 7C. There the fall in about one-quarter of a mile is about 20 feet.

There is also about 10 feet of a fall in a quarter of a mile in the rapids just below Wenebegon Lake.

The Abinette or Wabinette River is a fine stream about a chain wide in the lower part and about half a chain in the upper stream and is navigable in low water for loaded canoes to the south-east corner of Township 6A.

The west branch of this stream is usually navigable for loaded canoes but in low water is very tedious. We brought most of our supplies through by Embrass River and the long portage to Moule Lake and from there into the west branch of the Abinette by the canoe route shown on the plan.

The Embrass River above the portage about a mile or two from the mouth is badly obstructed for some distance, but above that is very good for canoes.

The Wenebegon is a clean, open river from the lake down to south line of 6D. It is said to be obstructed a good deal with driftwood below that.

Very great precautions were taken to avoid any risk whatever of fire spreading from our camp fires.

Moose and red deer are very plentiful. Pike seems to be the only fish in that region. In a number of places beaver are rebuilding old dams.

Accompanying this report are the account in triplicate, plan, field notes and timber plan.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) T. J. Patten,

Ontario Land Surveyor.

The Honourable, the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 24.

Survey of Township Outlines in the Temagami Forest Reserve, District of Nipissing, 1909.

Eganville, Ont., January 31st, 1910.

Sir,—I have the honour to submit the following report on the survey of certain township outlines in the Temagami Forest Reserve, District of Nipissing, made by me under instructions from your Department, dated the 27th day of May, 1909.

I left Latchford with my party on the eighth day of June last and proceeded by canoes up the Montreal River a distance of about fourteen miles, to where it is joined by the Mattawapika River; thence up the Mattawapika River, through the Lady Evelyn Lake, and up the river of the same name until I reached the Township of Gamble. The river crosses the south-west corner of this township and is joined by a small creek from the south, which creek crosses the south boundary of the above township about ten chains east of the post at its south-west corner, which post I made the starting point of the survey.

I was able with some difficulty to get my canoes up this small creek. The whole journey from Latchford occupied six days. The first half of the route is good canoeing, being largely through lakes; in the latter half, however, rapids are numerous and are difficult to get up with large canoes even in high water. The last day of the journey we were obliged to do considerable wading as the river becomes only a small creek, very shallow in places, and very crooked. I would not consider this route practicable for large and heavily loaded canoes at any time except during the spring floods.

The survey was commenced by taking an observation at the post planted by O.L.S. L. V. Rorke at the south-west corner of the Township of Gamble, and running west astronomically from it in six mile chords of latitude, intersecting

the line between the Districts of Nipissing and Sudbury run by O.L.S. A. Niven in 1896, at a point four chains and fifty-five links south of his forty-second mile post. These six mile chords form the south boundaries of the Townships of Corley, Leckie and Dufferin, the boundaries between which were run north astronomically to intersect with the second base line, which was run west astronomically from a post planted by O.L.S. Rorke on the easterly shore of Smooth Water Lake. This post was sixty-eight chains and fifty-four links west of the meridian forming the west boundary of the Township of Gamble, and forty-two chains and fifty links west of the meridian forming the west boundary of the Township of Brewster.

The first and second meridians forming the west boundaries of the Townships of Donovan and Charters, and the Townships of Ray and Leith, respectively, were run north astronomically from the second base line to intersect the line forming the south boundary of the Townships of Nicol and Milner, run by O.L.S. Rorke in 1908 and 1909.

The third base line was run west astronomically to the district boundary from a birch post planted by Mr. Rorke at the south-west corner of the Township of Corkill. An iron bar was planted alongside of this post and both were marked with the names of the townships in accordance with my instructions.

The fourth, fifth and sixth base lines forming the north boundaries of Leonard, Tyrrell and Knight, respectively, were run west astronomically from the south-west corner of Milner and the north-west corner of Van Hise, respectively, which corners were previously established by O.L.S. Rorke's survey.

The meridian between the Townships of Rankin and Raymond was run north astronomically from the north-west corner of Van Hise a distance of six miles, three chains and thirty-seven links, where both a wooden and an iron post were planted, being marked with the above chainage on the south side. The six mile point was found to come in the waters of Duncan Lake.

The details of the survey will be found in the field notes. The lines were well opened out and well blazed. Iron posts one and one-quarter inches in diameter were planted alongside of wooden posts at the township corners and both were marked with the name of the township on the side facing the township. Substantial wooden posts were planted at every mile and marked with the number of miles which they were west or north of the nearest township corner. Bearing trees were taken for all posts and recorded in the field notes.

Observations for Azimuth were frequently taken, but cloudy weather prevented their being taken as often as desired. The magnetic variation of the needle, while somewhat erratic in places, was mostly found to be from six to eight degrees west.

General Description.

The tract of country included in the survey is mostly rough and broken; the Townships of Corley and Donovan and the easterly parts of Leckie and Ray being particularly so; in these the hills often rise to elevations of from three to four hundred feet above the level of Smooth Water Lake. Rock outcrops are very numerous over the entire area. There are some swamps in the valleys but they are mostly of small extent. There is one of considerable size in the Townships of Leckie and Ray on either side of the Sturgeon River. From one-third to one-half of the area of these two townships is of a swampy nature, the timber

being chiefly spruce from four to eight inches in diameter. These swamp areas when cleared and properly drained could possibly be profitably cultivated but outside of them the country offers nothing from an agricultural standpoint.

Water.

The country in this region is well watered; small lakes and creeks are numerous. The more important streams are the east and west branches of the Montreal River, the Sturgeon River and the Wapoose Creek. These streams have no great volume of flow as the watersheds of each are not very extensive. They, in combination with the numerous lakes, furnish excellent facilities for travelling by canoe.

There are no water powers of much importance in the country surveyed. The only falls that occur are the Bridal Veil Falls on the east branch of the Wapoose Creek in the Township of Leith. They are from thirty to thirty-five feet in height, but the volume of water is so small that it is questionable if much power could be developed from them at all times of the year. As their name might suggest they are quite interesting from a scenic point of view. Splendid springs of pure cold water are often found.

Timber.

There is considerable timber of commercial value in this district. White and red pine are not often found in any quantity but are scattered more or less over the entire area. It is particularly noticeable along the shores of Smooth Water Lake and for two or three miles below on the banks of the Montreal River. It ranges in size from twelve to twenty-four inches in diameter. It is rough in quality but fairly sound. Banksian pine are abundant and vary from eight to twenty-four inches in diameter. Spruce, balsam, birch and cedar, also tamarac and poplar, are distributed pretty generally and are found up to twenty or twenty-four inches in diameter. There are considerable areas in the Townships of Raymond, Knight and Tyrrell which seem to have been burned over some years ago. They are now covered with a small thick growth of chiefly birch, poplar, spruce and balsam. Fire only a few weeks previous to this survey burned over a considerable portion of the parts of the Townships of Knight and Tyrrell south-west of Pigeon Lake and the Montreal River, destroying nearly all the timber and leaving a black brule. This fire originated north-west of Pigeon Lake, and was still smouldering along the west branch of the Montreal River in the latter part of August.

Minerals.

The entire territory included in this survey has been prospected for silver within the last two years and prospectors' camps were numerous. Outcrops of diabase were found in every township and were almost invariably staked. A good many prospectors seemed to be occupying themselves more in looking for areas not yet claimed than in actually searching for minerals.

Geological surveys have been made of the whole country by experts from the Bureau of Mines, so it would be superfluous for me to discuss the rock formation, etc., in this report.

An effort was made to "tie on" all surveyed mining claims, and they are shown on the plan and in the field notes. I found it impracticable to keep record of claims staked but not surveyed.

GAME.

The country abounds with moose, deer are not so plentiful. Evidences of the presence of bears were occasionally seen. Beaver are abundant and the smaller fur bearing animals are found. Fish were fairly plentiful in the lakes and streams, pike and pickerel being the most common, grey trout were caught in Smooth Water Lake from three to five pounds in weight and we were told by prospectors that they have been taken up to fifteen pounds.

Accompanying this report are a general plan, a timber plan, field notes and account in triplicate.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) HERBERT J. BEATTY.

The Honourable, the Minister of Lands, Forests and Mines,
Toronto, Ont.

Appendix No. 25.

SURVEY OF TOWNSHIP OUTLINES IN THE TEMAGAMI FOREST RESERVE, DISTRICTS OF NIPISSING AND SUDBURY, 1909.

GUELPH, ONT., December 31st, 1909.

SIR,—I have the honour to submit the following report on the survey of township outlines in the Districts of Nipissing and Sudbury in the Temagami Forest Reserve in accordance with instructions from your Department dated May 31st, 1909. Leaving Sudbury on the morning of the 7th of June, I proceeded by wagons to Lake Wahnapitae, then crossing the lake by canoes I ascended the Wahnapitae River to the north boundary of Parkin Township. After taking an observation on Polaris for meridian I commenced my survey at the north-east angle of that township and ran north six miles along the east boundary of Fraleck to the north-east angle of that township. I then turned west and ran the north boundary of Fraleck and from the post at the north-east corner of Creelman Township I ran north on the boundary between Grigg and Beresford six miles to my second base line. From that point I ran east six miles and then west six miles to O.L.S. Niven's district line of 1896.

By moving my supplies up the river as the work progressed and running the base lines as they were reached I produced the two meridian lines northward until they intersected the base line surveyed by O.L.S. Beatty earlier in the season and which formed the north boundary of the Townships of McLeod and Stull.

After producing my fourth base line westward to the north-west angle of the Township of Leask I proceeded by way of Welcome Lake and the Wahnapitae River to the forty-two mile post on O.L.S. Niven's district line, from which my fifth base line was started. This line I ran west six miles to the north-west angle of the Township of Unwin and then turned south and ran the meridian form-

ing the west boundaries of Unwin, Leask, McNamara and Beaumont to its intersection with the base line run by O.L.S. Proudfoot in 1888, and at the same time completing the north boundaries of the two last named townships as they were passed.

The base lines were run as six mile chords of a parallel of latitude and frequent observations were taken throughout the survey to verify the accuracy of the work. The lines were well cut out and well blazed and a substantial wooden post was planted at the end of each mile and marked in Roman numerals, on the east or the south side, with the number of the mile counted west or north from the township corner. Where loose stones were convenient a mound was built around the post, bearing trees were also blazed and marked at each post. At each township corner an iron post 1¼ inches in diameter was planted beside the wooden post and both were marked with the names of the adjacent townships.

The country included within the limits of this survey is for the most part rocky, much of it is extremely hilly and very little of it is suitable for agricultural purposes. The greater part of it is drained by the Wahnapitae River, which is, throughout the most of its length, a swift flowing stream broken by numerous rapids. During low water the volume of the flow is small and therefore it will not have much value for the development of power. Through the kindness of Mr. W. R. Rogers of the Bureau of Mines I am able to show a correct map of this river and of Burwash and Welcome Lakes.

The Sturgeon River drains the Township of McLeod and the eastern part of Haentschel Above the junction of the Stull branch it is a small stream and little used as a canoe route

The Vermilion River crosses the south-west corner of Beaumont and drains most of that township and the western part of McNamara. This stream is also small during low water.

The main line of the Canadian Northern Railway here follows closely the west bank of the Vermilion. At the time of survey the work of grading was well advanced and the rails have since been laid.

The country is fairly well timbered. White pine of medium quality was found scattered over a considerable portion of the area. Jack pine of good size and quality is found in large quantities in some townships, there is also a large amount of spruce suitable for pulpwood and some poplar, balsam and white birch.

There was considerable activity among prospectors in the northern part of the country this year, a great many claims have been staked and some promising indications of silver are said to have been found.

Very few fish were found in the lakes and streams and small game was scarce. Red deer were scarce but moose were plentiful and a few bears and beaver were seen.

Accompanying this report are the field notes of the survey and a map of the townships outlined and a timber plan

I have the honour to be,

Sir,

Your obedient servant,

(Signed) James Hutcheon.

The Honourable, The Minister of Lands, Forests and Mines,
Toronto, Ont.

Appendix No. 26.

SURVEY OF TOWNSHIP OUTLINES, TEMAGAMI FOREST RESERVE, DISTRICT OF NIPISSING.

NEW LISKEARD, ONT., December, 1909.

SIR,—I beg to submit the following report on the survey of Township Outlines in the district between Lake Temagami, Lady Evelyn Lake, Mattanapika River and the Anima Nipissing Lake in the District of Nipissing, performed under instructions dated July 22nd and September 15th, 1909.

I commenced my survey at the south-east angle of the Township of Rorke and ran the south boundaries of Leo, Dane and Kittson, due east astronomically (six mile chords) to intersection with the westerly boundary of the Township of Coleman. The northerly three miles of the boundary between the Townships of Leo and Dane, previously run by O.L.S. L. V. Rorke, was produced to intersection with this line, and then produced southerly to intersection with the line produced due west astronomically, from the north-west corner of the Township of Chambers, from a point on this line, six miles south of the Township of Dane, the south boundary of the Townships of Cole and Brigstocke was run east astronomically (six mile chords), a distance of twelve miles; from six mile posts on this line meridians were run north and south to intersection of east and west lines already described.

The above lines were well opened up and the adjacent trees blazed as in the usual manner, while wooded posts of the most durable material available, properly and distinctly marked, were placed where possible at the even miles from the southerly or easterly extremities of the above lines. Where these points came in the water or on the face of a rock or otherwise, the posts were planted at the nearest suitable point with the chainage in miles, chains and decimals marked on the proper faces of the post. Posts were in all cases firmly planted, generally a mound of stones being built around the post to render it more permanent, and suitable bearing trees were marked and recorded in the field notes.

Iron bars marked with the chainage and name of adjacent townships were placed alongside of wooden posts at the following points, viz.:

On the south boundary of the Township of Leo, at the easterly shore of Willow Island Lake, at the south-east corner of the Township of Leo, at the south-east corner of the Township of Dane, at the north-east corner of the Township of Dane, at the north-east corner of the Township of Brigstocke, at the south-east corner of the Township of Kittson, at the south-east corner of the Township of Brigstocke, at the south-east corner of the Township of Cole, at the south-west corner of the Township of Cole. No iron bars were planted on the south boundary of the two unnamed townships to the south of the other townships, whose outlines I surveyed.

At frequent intervals throughout the survey observations on Polaris were taken for the purpose of obtaining Azimuth and the magnetic variation which ranges between eight and nine degrees west of north was noted, the results being entered in the field notes.

Throughout the survey the chain bearers were duly impressed with the importance of their duties, particularly with regard to care and accuracy in their operations and the necessity of keeping the field notes so that the natural features would be plainly shown.

Soil.

This territory, if deprived of its timber and vegetation, would present a very barren and inhospitable appearance, the surface being generally rock or boulders and loose stones with very little soil except in the swamps. Any soil present consists of sand or a very light sandy loam of a questionable agricultural value. The only settler in the country is located at the outlet of the creek from Red Squirrel Lake into Sandy Inlet on Lake Temagami.

Rock Formation.

The whole country is composed of sharp rocky ridges, generally lying in a northerly and southerly direction with frequent cliffs and abrupt descents. The rock is principally diabase of the Past Huronian period, and quartzite slate and conglomerate of the Lower Huronian. Considerable prospecting has been done throughout the more accessible part of the country Several properties are being developed this winter and it is expected that by spring a more definite knowledge of the country will be obtained.

Timber.

The most of the timber of this country has been burned away and now it consists principally of second growth poplar, birch, spruce, balsam and small pine. Some small groves of red and white pine have escaped the fire, the principal one being noticed from the line between the Townships of Dane and Kittson. It appears to extend both east and west from this line for a considerable distance. Also along the fifth mile of the southerly production of the east boundary of the Township of Brigstocke a small grove was noticed just to the east of the line. Banksian pine is pretty well distributed throughout this region, but it is of a small size and generally pretty scattering. Very few swamps were met with, but in these spruce and a few cedar of fair size and quality were noticed, while the tamarac, as is common throughout this northern part of Ontario, is dead.

There are no water powers of any value in this country, which is somewhat curious from the large number of streams and lakes that are constantly met with. It is from this fact and also from the beauty and picturesqueness of the landscape when viewed from a canoe that has caused this region every fall to become a Mecca of tourists. Nothing need be said about the beauties of this country or its fame as a fishing or hunting preserve. It has been effectively and repeatedly described by the various pamphlets issued by our railway companies, by the many articles in our sporting magazines and by the press in general.

Accompanying this report is a general plan on a scale of one mile to an inch, a timber plan of the same scale, field notes, oaths of chainmen and all the other necessary documents.

All of which is respectfully submitted.

I have the honour to be,

Your obedient servant,

(Signed) C. H. Fullerton,

Ontario Land Surveyor.

The Honourable, The Minister of Lands, Forests and Mines,
Toronto, Ont.

Appendix No. 27.

SURVEY OF TOWNSHIP OUTLINES IN THE TEMAGAMI FOREST RESERVE, DISTRICT OF NIPISSING, 1908.

TORONTO, ONT., November 30th, 1908.

SIR,—I have the honour to submit the following report upon the survey of certain Township Outlines to the east of the East Branch of the Montreal River in the Temagami Forest Reserve, made by me under instructions from your Department, dated the twenty-seventh day of May nineteen hundred and eight.

Leaving Latchford on the tenth day of June with my party and outfit I proceeded via the Montreal River to the field and commenced operations in due course. The first meridian line was run due south from a point six miles due west of the north-west angle of the Township of Farr and forms the eastern boundary of the Townships of Morel, Haultain, Nicol, Charters and Donovan. The second meridian line was run north from a point six miles due west from the south-west angle of the Township of Rorke and forms the eastern boundary of the Townships of Gamble, Brewster, Corkill, Lawson, Chown and Shillington.

Base lines were run six miles east and six miles west from the north-west angles of the Townships of McGiffin and Tretheway, in other cases were produced west from points established last year.

Three of these were produced westerly to the East Branch of the Montreal River, as follows:

The north boundary of the Township of Morel intersecting at Sisseney Lake, the north boundary of the Township of Nicol at Burk Lake and the south boundary of the Township of Donovan at Smooth Water Lake.

From the last mentioned intersection I connected by triangulation across Smooth Water Lake with P.L.S. Sinclair's 1 mile point on his survey of the East Branch of Montreal River made in 1867, where I found an eight inch red pine tree blazed on four sides and a few feet away on another red pine, the name "D. SINCLAIR, P.L.S." (date), cut in and although somewhat charred by fire since being placed there, was still quite distinct, the date alone being indistinct.

Good substantial squared wooden posts were planted at every mile throughout the survey, excepting where such point came within a lake or river, in such case a witness post was planted at the shore with the proper chainage inscribed thereon. The mile posts were all properly marked with the mileage, numbered from the east and south from 1 M. to 6 M. for each township boundary.

Iron posts one and one quarter inches in diameter were planted in addition to the wooden posts at township corners and also at the intersections before mentioned at Smooth Water and Burk Lakes on the East Branch of the Montreal River.

PHYSICAL FEATURES.

In general the surface of the country traversed is very broken and rough, high hills, with rock surface succeed each other with marked regularity as the country is travelled from east to west. The watershed towards the East Branch does not extend more than two miles to the east.

The headwaters of the South-west Branch of Bear Creek, Stony Creek and North Branch of Lady Evelyn River are situate within the Township of Corkill where a number of small spring lakes and ponds are found.

The largest valley noticed was that through which the East Branch flows in a very winding course in the Townships of Charters and Nicol, being from 1 to 2 miles wide. The banks of the stream are of good clay loam. The soil in general throughout the country is sandy with loose rounded boulders, but the country rock is not very deep below the surface, even in the swampy tracts.

Timber.

The different kinds of forest trees which are found growing in any quantities are jack pine or Banksian pine, birch, spruce, poplar, balsam, cedar and red and white pine. The fires which swept over that country years ago seem to have burnt in small areas and at different times; especially is this noticeable in the southern part, where small second growth jack pine, birch and poplar will be found on one ridge while the next will be covered with the same kind of trees averaging from 6 to 16 inches in diameter. In general terms I would describe the forest which has survived the fires within the past semi-centenary as consisting of Banksian pine, spruce, poplar, balsam, birch and cedar, averaging from eight to sixteen inches in diameter. Also small bunches of red and white pine in the Townships of Charters, Donovan, Gamble, Brewster, Tretheway and McGiffin from 10 to 30 inches in diameter. That of more recent growth consists of Banksian pine, spruce, balsam, birch and poplar varying in size up to 8 inches and thickly studding the surface.

During the past season a large tract of country was burnt over adjoining Stony Lake, Bloom Lake, Miller Lake, Lost Lake, GowGanda Lake, Obuskong Lake and along the water routes joining these lakes, and while no great quantity of valuable timber was destroyed one of the finest and most attractive canoe routes in Northern Ontario has been disfigured. No fires occurred to my knowledge during the season south of this one throughout my work.

Water and Water Powers.

Very few rainfalls during the past summer caused the creeks to become very shallow and canoeing on the upper waters of the streams met with was difficult. Old portages were cleaned up where occasion required their use and several new ones were cut out. Big Bear or Macobe Lake is the largest body of water within this season's work, being over eight miles long and three wide.

There are no falls or rapids within the territory attractive for water power development.

Rock Formation.

The northern part of this territory has been investigated closely by the Department of Mines, in the southern portion quartzite extends throughout with here and there small dykes of diabase.

Game.

A large number of moose were seen during the work in the Lady Evelyn River country. Also signs of bear and several instances of fresh beaver work. Wolves were also heard on several occasions within short range of camp.

Not many fish were caught in the lakes or streams, pickerel, pike, bass and trout being the varieties seen.

Accompanying this report I submit plan, field notes, affidavits and accounts.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) L. V. Rorke,

Ontario Land Surveyor.

The Honourable, The Minister of Lands, Forests and Mines,
Toronto, Ont.

Appendix No. 28.

Township Outlines, District of Sudbury.

Peterborough, December 27th, 1909.

Sir,—I have the honour to submit the following report on the survey of Township outlines in the Temagami Forest Reserve, District of Sudbury, performed by me under instructions from your Department, dated July 26th, 1909.

I commenced the survey at the sixty-sixth mile post on the boundary line between the Districts of Nipissing and Sudbury. From this point I ran the north boundary of the Township of McMurchy due west astronomically six miles. From the end of the sixth mile I ran the west boundaries of the Townships of McMurchy, Fawcett, Ogilvie and Browning due south astronomically, a distance altogether of twenty-four miles and nineteen links, where I intersected the north boundary of the Township of Unwin run by O.L.S. Hutcheon during the past season. I produced the north boundary of the Township of Unwin due west astronomically six miles from the north-west angle thereof.

From the ends of the sixth, twelfth and eighteenth miles coming south, I ran the north boundaries of the Townships of Fawcett, Ogilvie and Browning due east, astronomically, to the District boundary line, which I intersected, sixty-five links north, fifty-one links south and nineteen links north of the sixtieth, fifty-fourth and forty-eighth mile posts respectively. Going west from the District line along the north boundary of the Township of McMurchy the first mile and a quarter, which is of a swampy character, was burnt over during May of the present year. From this point to the end of the sixth mile the country is rough, rocky and hilly, timbered with Banksian pine, spruce, white birch, balsam and some cedar, with alder and willow underbrush and heavy windfalls. The average size of the timber along this line is about ten inches. The Montreal River, a small, swift stream at this point, is crossed on the second mile. Going south along the west boundaries of the Townships of McMurchy and Fawcett, no material change in the character of the country is noticeable, with the exception that some scattered red and white pine of fair quality and up to thirty inches in diameter are met with.

Going west from the District line along the north boundary of the Township of Fawcett to the Montreal River, a distance of four and one-half miles, the

country which is of the same rocky, broken character, was burnt over about forty-five years ago and is now grown up with small Banksian pine, spruce, white birch, poplar, alder and willow. The Montreal River at this point is about two chains wide, with a rather sluggish current. From the river to the north-west angle of the township the character of the country is very similar to that of the west boundary.

Going west from the District line along the north boundary of the Township of Ogilvie, the country is of a rolling character, but with the exception of a little more spruce, the timber remains the same.

Going south along the west boundary of Ogilvie and approaching the height of land between the waters of Lake Huron and the Montreal River, the country is generally swampy, with spruce of fair size and in some places open spruce swamps. The height of land is crossed about half a mile north of the south-west angle of the township. The north and west boundaries of the Township of Browning are more or less swampy with knolls of Banksian pine, white birch and poplar.

Going west from the north-west angle of the Township of Unwin to a point twelve miles west of the District line, the country is rough, rocky and broken, and with the exception of a few scattered white pine and some large hard maple, the timber remains the same.

There is a considerable quantity of white and red pine of fair quality and up to thirty inches in diameter, extending across the Township of Fawcett and especially along the Montreal River.

As in the case in the Clay Belt, nearly one hundred miles to the north, all the tamarac in this locality is dead.

Numerous lakes and streams were met with, all containing the best of water. The largest body of water seen is Sandy Lake, in the Township of Ogilvie, from which this branch of the Montreal River takes its rise. It is a beautiful sheet of water nearly two miles in length by one mile in width, with a wide sandy beach. Less than a quarter of a mile south of Sandy Lake and on the other side of the height of land, Rosie Creek (a feeder of the Wahnapitae River) takes its rise; from this point to the south boundary of the Township of Browning is a chain of small lakes, which constitute the canoe route from the Wahnapitae River into this locality.

The canoe route, as a whole, through these four townships is very difficult and slow, especially on the Montreal River through the Township of McMurchy, where a succession of rapids have to be overcome. The geological formation of this locality is the Huronian; numerous small veins of calcite (yellowish white) are met with, and I understand native silver has been discovered on Rosie Creek in the Township of Browning. Numerous parties of prospectors were seen, all apparently heading for Shining Tree Lake.

Throughout the whole survey, and particularly when in the vicinity of Shining Tree Lake, I kept a sharp lookout for the lines of any mining claims that we might cross. I have to report, however, that none were seen.

There is no agricultural land in this locality.

The magnetic variation of the needle is about 7 degrees 30 minutes west.

I found the moose, partridge, beaver and otter very plentiful in this section of the Reserve.

In conclusion I beg to state that a great amount of labor and hardship was experienced by myself and party in connection with this survey, with over one

hundred miles of canoe journey and numerous portages, some of which are over two miles and one-half in length, to reach my starting point rough, broken, brushy country to cut through, and with almost continuous rain during the months of August and September.

Accompanying this report are plans, field notes and accounts, all of which I trust will be found complete and satisfactory.

I have the honor to be,
Sir,
Your obedient servant,
(Signed) J. W. FITZGERALD,
Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 29.

SURVEY OF THE TOWNSHIP OUTLINES, DISTRICT OF SUDBURY.

ORILLIA, October 8th, 1910.

SIR,—By instructions issued from the Department of Lands, Forests and Mines under date of the 28th day of April, 1910, we were directed to make surveys of certain township outlines in the District of Sudbury. Having made such preliminary arrangements as are necessary to carry out work of that character, we left Biscotasing with our party on May 24th following, for the site of the future survey operations. The supplies and heavy part of the outfit were conveyed over the land portages by the teams of the Bisco and Gowganda Transportation Company, and on the water stretches from the height of land in canoes. Our party followed the old canoe route up Bisco Lake, down Bisco Creek, and thence over the height of land to the Mattagami waters, and down the Mattagami River to Lake Kenogamissee. At the latter point, hearing of a portage route leading to the east across the Kapiskong River and into Lake Papakomeka, thus presumably crossing our westerly meridian at about half way in its length, the main bulk of the supplies were sent across that way, while the remainder of the party proceeded down the river to the Porcupine Portage, and thence crossing this portage to the westerly boundary of the Township of Tisdale and south on that line to Niven's base line at the south-west angle of Tisdale, were in a position to commence actual survey work on the second day of June.

As it was impossible, owing to cloudy weather conditions, to obtain an astronomical observation to commence the work, our westerly meridian beginning at the aforesaid point was turned south from Niven's base line and corrected by observation as soon as this could be obtained. Thereafter observations were taken whenever possible, but the cloudy and wet weather prevailing during our trip in, and for some days after commencing work on the line, gave place to hot, dry weather and forest fires, and the smoke from the latter proved quite as effectual a blanket in hiding the heavenly bodies as the clouds had previously been.

Wooden posts were planted at the end of each mile on the base and meridian lines, and were marked with the mileage dating on meridian lines from the next base line to the south and on the base lines from the next meridian to the east. In addition to these wooden posts, at each township corner, with the exception of the north-west corner of Deloro, where the iron post marking XII. M., on O.L.S. Niven's base line was used, an iron post was planted and marked with the names of the respective townships for which it stood, on sides facing diagonally into these townships. An iron post was also planted on the west boundary of the Township of Bartlett and marked V. M.

Magnetic Variation.

Throughout the area covered by the survey the magnetic meridian, excepting at a few points where strong local attraction was apparent, showed but little fluctuation, the mean declination of the needle being about 7½ degrees west of astronomic north.

Soil.

The northerly part of the territory covered by the survey along the west boundary of Deloro and Adams and also the country traversed by the line between those townships is of comparatively level or slightly rolling character. It contains some level tracts of clay capable of agricultural development, while the higher levels are occupied by sandy soil with occasional outcrops of rock. Proceeding south from the section above referred to, a more rugged character prevails, the soil being sandy and stony, quite unfit for profitable agriculture, and presenting a generally hilly surface. In travelling south on our westerly meridian this change from a level or slightly rolling character to that of a rugged and hilly aspect, is abruptly marked at a point just south of the portage into Lake Papakomeka, crossing this line a little more than a quarter of a mile south from the boundary between Adams and McArthur. The country cannot be called rough in comparison to what prevails further to the south in some sections of the rock country, but is broken by low hills and ridges of from twenty-five to one hundred feet in height, the latter elevation, however, being rare.

Timber.

In a description of the timber values within the area of the survey, it would suggest comparison with certain patent medicine advertisements showing the "before" and "after" effects upon the patient, only that in the present case the pictures would be reversed. Much of the timber standing on the north-western part of the area in the Townships of Deloro and Adams when the lines were run was subsequently rendered worthless by the widespread forest fires.

The forest growth comprises the usual soft wood varieties of the district, and the chief values would lie in spruce and balsam pulpwood and in jack pine tie timber. A fine tract of jack pine running from six to fifteen inches in diameter and occupying a sandy plain, is crossed by our westerly meridian between V. M. and III. ½ M. on the west boundary of Deloro. Along the west boundary of Bartlett there is also a good deal of jack pine suitable for railway ties, growing generally with thick balsam and spruce. Large jack pine, with spruce, balsam, poplar and

birch, also occurs east of the lakes on the south boundary of Geikie. There are numerous cedar swamps within the area, but the trees are usually short and limby, often hollow, and seldom in sufficient quantity in any one locality. The tamarac, while a common tree over the whole area, is all dead and much of it too far advanced in decay to be commercially valuable. White pine is scarcely a factor in the forest growth of this section, being mostly confined to scattered trees of little commercial importance. The largest area of white pine observed was between the west boundary of McArthur and the stream flowing north into Lake Papakomeka. There is one belt here extending about a mile north and south from opposite about 2½ M. to 3½ M., of trees from 14 to 24 inches in diameter, and many scattered trees. Much of this area, however, was burned clean during June of the current year and the timber, including this pine, fire killed.

How much damage the fire has caused during the present season throughout the area covered by the survey, it would be difficult to estimate, but it has swept a large area, and where it struck the old windfallen brulés it left little but bare sand. About the middle of June, bush fires began to be in evidence, and clouds of smoke could be seen now in one direction and now in another, and on the 24th of that month, on resuming our westerly meridian, we entered the fire area, at V. M. on the west boundary of McArthur. This fire swept across the above township from the east, travelling from east of Lake Papakomeka across the part traversed by the meridian in a single night and spreading west and south. A great part of this township was swept by this fire. In running the meridian south across McArthur and the northerly part of Bartlett we were compelled to keep our camp on the canoe route leading south from Lake Papakomeka, owing to the near proximity of the fire, and even along this water route the bush was burning, and it required the utmost vigilance to preserve the outfit from destruction. On two nights on the water route our camp was surrounded by fire and trees were crashing down within a few chains. Caches of supplies had to be made carefully, in one case in a canoe anchored out in the lake, canoes had to be guarded, and at all times fire was a main factor in all our movements. The smoke obscured the sun during the day and the sickening crash of falling trees was an ever-present sound. This condition of things ended in one grand rush of the fire to overtake us when running our south base line west across the large lake, presumably Akikenda, between IV. M. and V. M. on the south boundary of Bartlett. In this we barely escaped across the lake with our supplies before the flames reached the west shore. This fire travelled on a west wind through an old windfallen brulé with frightful rapidity, and was still burning in the green timber along the lake when we moved east on our line the following day. From here east, however, we saw no more fire. On sending men back along our westerly meridian to bring up canoes left at Porcupine Portage on the Mattagami River, they reported burnt country from about III. M. on the west boundary of Adams to Niven's base line. This was all green when the line was run early in June.

We had abundant opportunity for observation and reflection on the subject of forest fires, and it appears strongly to us that mineral development and timber conservation in the same area are policies incompatible, and that a very few seasons of the tinder box variety, such as the present, will be sufficient to wipe out timber values in this Reserve, unless much more drastic measures are adopted for its protection.

Geology.

No attempt will be made to describe the geology of the region, which is well supplied with experts in that field. In the northerly portion, however, such rock outcrops as were met with were mostly of a greenish fine-grained variety, varying from a schistose to almost massive structure often in an interval of a few yards, and apparently belong to the Keewatin series. Porphyritic granites, traps, diabase and gneiss were also met with in various locations and are shown in field notes. No veins or mineral deposits of any apparent economic value were met with. The southerly portion traversed by the lines bounding the Townships of Bartlett and Geikie appears to be a much disturbed area and looks like good prospecting ground.

Waterways.

The only canoe route traversing this area with which we are acquainted is a continuation of that over which we took our supplies from Lake Kenogamissee. This route leaves the above lake at a creek entering from the East at about three-quarters of a mile above Wawaitan Portage and proceeds by a two-mile portage to Grassy or Kapiskong River, up the latter river about two miles, passing in the interval a portage round a falls on the river, and leaving the river about half a mile above the head of said falls, thence over a portage of about fifty chains easterly to a lake, and from the easterly end of the latter lake down a short but steep portage into a creek flowing north and passing about 25 chains west of our westerly meridian, with which it is connected by a good level portage leading to Lake Papakomeka. This latter creek is a branch of Mountjoy Creek. South from Lake Papakomeka the creek is navigable for canoes as far as the first lake south of the line between McArthur and Bartlett, but has numerous rapids and we found it necessary to do a large amount of cutting to get up. The creek flowing north out of Lake Papakomeka is also a branch of what has been called on previous plans Mountjoy Creek, and enters the Mattagami River near Porcupine Portage. This latter creek has not been cut out for canoe travel and would require a large amount of work to make it navigable, but has plenty of water. The largest lakes met with were those crossed by our easterly meridian at I. M., between McArthur and Douglas, and the lake crossed by our base line between IV. M. and V. M. on the south boundary of Bartlett and which we understand to be Lake Akikenda. The limits of neither of these lakes could be ascertained. As usual in this part of the country the district is well watered. The drainage of the part between our eastern meridian and the District line appears to be through the branches of the Red Stone and Nighthawk Rivers into Nighthawk Lake.

Moose were fairly abundant, but not so much in evidence as in some localities further south. In fur-bearing animals the beaver was especially noticeable, being more plentiful than in any section we have visited for some years. We ran across new dams and fresh cutting quite frequently and the district does not appear to have been recently trapped over.

We have the honour to be,
Sir,
Your obedient servants,
(Signed) Cavana and Watson.

The Honourable the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 30.

SURVEY OF OUTLINES OF TOWNSHIPS, DISTRICT OF SUDBURY.

SUDBURY, August 30th, 1910.

SIR,—We have the honour to submit the following report on the survey of the outlines of the following townships, viz., Sweeny, Frechette, Lampman, Hodgetts, Amyot, Sheard, Asquith and Churchill, performed under instructions dated May 4th, 1910.

This survey was commenced on May 26th, the party leaving Sudbury on the Canadian Northern Ontario Railway and going as far as Post Lake.

The work was commenced at the south-west angle of McNamara, the first base line being run west, astronomically, six miles, from this point a meridian line was run as far south as O.L.S. Proudfoot's base line, from the north-west angle of Sweeny the work was carried on northerly and the base lines run east, astronomically every six miles.

The north boundary of Hodgetts, which was run last season by O.L.S. Fitzgerald was connected up to the meridian line, the latter being seventy links west of the sixth mile post.

The north boundary of Churchill, which had already been run by O.L.S. Fitzgerald, was tied on to and his posts moved to the intersection of the meridian line, and his base line.

The south boundary of Lampman was rechained a second time owing to the surplus noticed, only a small difference from the first chainage was found.

Iron posts 1¼ inches in diameter and 6 inch wooden posts were planted at all Township corners and marked as instructed, 6-inch wooden posts properly marked were planted at every mile, both on the meridian line and the baselines.

The timber consists mostly of birch, poplar, spruce and balsam, a small patch of white pine was encountered along the north boundary of Sweeny. There are a few spruce swamps, but the timber is small. The west boundary of Hodgetts consists mostly of Banksian pine about 8 inches to 10 inches on the average.

No recently burnt country was encountered, except near the Right of Way of the Canadian Northern Ontario Railway at Gowganda Junction and immediately west of West Shining Tree Lake, an area of little over a square mile having been burnt last season.

Along the west boundary of Asquith and Churchill there is a fair amount of hardwood bush interspersed with cedar swamps, the cedar being of large diameter but stunted in height and, as a rule, hollow.

The easterly boundary of Sweeny is mostly small, dry tamarac and second growth birch and poplar.

The most northerly townships are very rough and hilly, and the southerly townships consist more of rolling country. In the vicinity of Esker Lake and the Opickinimaka River the country is swampy.

The country as a whole is well watered and canoe routes are numerous.

The rock is mostly granite and diorite, some diabase being encountered at Esker Lake. An iron formation crosses through the northerly part of the Township of Asquith, also a variation of 10 degrees to 15 degrees was noticed with the needle in this vicinity.

Observations were taken as frequently as possible, though most of the time the weather was extremely cloudy.

The land is not suitable to agriculture, being either too rough or sand plains.

No water powers of any commercial value were met with though small falls and shallow or flat rapids on the rivers and streams are numerous especially on the Opickinimika River.

Game is very plentiful and consists principally of moose and deer. Signs of bear were plentiful, though few were seen.

The partridge appear to be increasing very rapidly and were quite numerous. Ducks are plentiful.

The lakes are all well stocked with fish, the beaver are also very numerous on the small lakes and rivers.

Accompanying this report is a mounted plan, a timber plan on tracing linen, a blue print showing canoe routes sketched in, field notes and chain bearers affidavits and an account duly sworn to.

We have the honour to be,
Sir,
Your obedient servants,
(Signed) DeMorest, Stull and Low,
Ontario Land Surveyors.

The Honourable the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 31.

Township Outlines, District of Sudbury.

Eganville, October 1st, 1910.

Sir,—I have the honour to submit the following report upon the survey of certain township outlines in the District of Sudbury, made by me, under instructions from your Department, dated May 2nd, 1910.

I proceeded from Bisco Station, C. P. Railway, via Bisco and Gowganda Transportation Company route, as far as Sucker Lake, where I left the Old Mattagami Route and proceeded in a course almost due north via Mesomekinda, or as it is better known locally, Beaver Lake, and Kenogaming Lake to the portage, from the north end of Opeshingquaquaga Lake, leading into Trout Lake, in the Township of Whitesides.

This, on the whole, is a fairly good canoe route, and while there are between twenty and twenty-five portages, none of them north of Sucker Lake are over one-half mile long. There is one stretch of shallow creek, about six miles long to ascend, commencing four or five miles north of Beaver Lake. The map furnished me shows a portage from Lake Kenogaming into Lake Aqnesqna, and omits to show Kenogaming River flowing north out of former lake, there being two short portages between Kenogaming and Aqnesqna. An accurate map of the greater part of this route could be compiled from records of survey made by James Bay Railway Company.

From Trout Lake, I proceeded to Niven's 30-mile post, and in accordance with your instructions from this post I ran my first meridian due south, astronomically, six miles. I then ran the south boundary of the Township of Carscallen east to intersection with meridian run by Lang and Ross this summer, and I ran the south boundary of Whitesides west, a distance of six miles, from which point I projected my second meridian north, astronomically, to intersection with Niven's base line and south to the intersection with south boundary of Pharand Township.

The south boundaries of Keefer and Hillary townships were started east from posts established on my second meridian, the running of the former having to be postponed until after the latter, on account of the danger from fire that was running through that section.

After having run these south boundaries, I returned to my first meridian and ran it due south, astronomically, running the south boundaries of Denton and Reynolds east, astronomically, from the intersection of said meridian with south boundaries of Keefer and Hillary townships respectively.

The south boundaries of Childerhouse and Pharand townships were run east and west respectively from a point on my first meridian distant twenty-four miles south from Niven's base line.

Substantial wooden posts were planted at the end of every mile, excepting where these points were located in water, and in such cases witness posts were planted on the shore and marked as shown in field notes. Wooden posts and iron bars were planted at all township corners, excepting at the corner of Whitesides, Carscallen, Denton and Keefer, and on account of this corner being in a lake, witness posts were planted on the line between Keefer and Denton at a point distant three chains south of the corner.

All posts are marked as set forth in the field notes, two bearing trees being marked, distances and bearings to which were taken and recorded for each post wherever they could be obtained, the posts being firmly driven in ground wherever possible and stones planted around them while available.

The country as a whole is fairly level, very few hills of any height being seen, the surface is either level or gently rolling with occasional outcrops of rock, but owing to surface being thickly wooded and usually covered with moss we had not an opportunity of seeing any indications of minerals, though I have heard that since I ran the west boundary of Denton Township a considerable portion of it has been staked.

The soil is utterly unfit for agricultural purposes, being either sandy or very stony. The swamps, which form a considerable percentage of the total area, appear to be nothing but a bed of boulders, once you get through the moss and muck on the surface.

As the area embraced in this survey is adjacent to the Porcupine Gold Fields, there is no doubt that it will be thoroughly prospected, but we saw no exposures of rock that would lead us to expect that it will turn out a mining country.

The timber that is of any value is principally spruce and Banksian pine, a considerable quantity of the latter of good quality being found through Childerhouse, Reynolds and Denton townships. Red and white pine from 12 to 30 inches in diameter is found round Trout Lake and on the islands therein; also on the line between the townships of Keefer and Hillary, extending about three-quarters of a mile west of Otter Lake, but owing to our outlines being six miles apart it is impossible to give a report on the timber that is of any practical value. The pine on the west side of Otter Lake appeared to be the most valuable, but the area on which it is growing may be of comparatively limited extent.

Moose are very plentiful and the fishing is fairly good. Trout Lake is a beautiful sheet of clear water, with many islands, and, as the name implies, is supposed to furnish some trout fishing. Pickerel and pike are very plentiful in Apishingquaquaga Lake, particularly so at the falls at the south end where the stream enters. This falls is the only one we encountered within the limits of our survey, but does not appear to be of much value as a water power, the stream being so low in July that one would have no difficulty in crossing it at the falls, without getting one's feet wet. However, if storage for water was provided on Lake Kenogaming it might be made of some value.

Forest fires were very prevalent and I believe that the township of Denton is nearly all brulé now.

Accompanying this report are field notes, plan of survey, accounts in triplicate and the customary affidavits.

I have the honour to be,
Sir,
Your obedient servant,
(Signed) HERBERT J. BEATTY,
Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 32.

SURVEY OF THE TOWNSHIP OF BLOUNT, DISTRICT OF NIPISSING.

DELTA, ONT., July 27, 1909.

SIR,—Under your instructions, dated May 31st, 1909, I have surveyed the Township of Blount, in the District of Nipissing, and beg to submit the following report.

All lines were run with the transit, well opened up and blazed. Frequent observations of Polaris at elongation were taken as the survey progressed.

The iron bars furnished by your Department were planted and marked as directed and their places and markings shown on the field notes.

At the following points iron posts 1⅞ inches in diameter were planted.

At the intersection of the centre lines of the road allowances at the north-east angle of the Township marked "BLOUNT" on the south-west side and "R" on four sides.

At the intersection of the centre lines of the road allowances at the north-west angle of the Township marked "BLOUNT" on the south-east side and "R" on four sides.

At the intersection of the centre lines of the road allowances at the south-west angle of the Township marked "BLOUNT" on north-east side, "GLACK-MEYER" on south-east side and "R" on four sides.

At the intersection of the centre lines of the road allowances at the south-east angle of the Township marked "BLOUNT" on the north-west, "GLACK-MEYER" on the south-west and "R" on four sides.

At the following points iron posts 1¼ inches in diameter were planted:

At the intersection of the centre of the road allowances along the east boundary of the township and the centre of the road allowance between concessions VI. and VII.

At the intersection of the centre of the road allowances along the north boundary of the township and the centre of the road allowance between lots 12 and 13.

At the intersection of the centre of the road allowance along the east boundary of the township and the centre of the road allowance between concessions VI. and VII.

At the intersection of the centre of the road allowance along the south boundary of the township and the centre of the road allowance between lots 12 and 13.

At the intersection of the centre of the road allowance between concessions VI. and VII. and the centre of the road allowance between lots 12 and 13.

A careful traverse was made of the Abitibi River. With the exception of Island "A," at the head of the Long Soo Rapids, the others are simply sand bars which are submerged in ordinary stages of high water.

The general level of the country is from sixty to one hundred feet over the Abitibi River.

Soil—clay and clay loam, covered with vegetable mould and moss. Rock exposures in the Long Soo Rapids are gneissoid.

Timber—spruce, poplar, white and yellow birch, balsam and willow, varying in diameter from a few inches to two feet.

The Abitibi and Chin Rivers afford good drainage facilities. The Abitibi varies in width from five to ten chains. The Chin from three to five rods.

The Long Soo, commencing at Island "A," is a succession of rapids and falls about five miles in length. There is also a very strong current from the foot of the rapids to where the river crosses the west boundary of the township. A dam placed at the foot of the rapids, or lower down the stream, of sufficient height to raise the water, say, five feet over still water level at Island "A" (at low water level) would back water over two small rapids in the township of Glackmeyer and give unbroken navigation from the dam to the G.T.P. Railway crossing and beyond to Iroquoi Falls and afford or supply electrical power for manufacturing purposes at the dam and at the railway crossing.

When the township is opened up for settlement the present colonization road running north from Cochrane should be continued to and across the Abitibi River on the side road between lots eighteen and nineteen; there is good foundation for a bridge in the rapids.

In my opinion the township should not be opened for settlement until there is a local market for pulpwood at the railway crossing or at the dam. The wood would pay for clearing and encourage settlement.

Moose are plentiful and a few common deer and beaver. Partridge, plentiful.

Accompanying this report you will please find full returns of survey.

I have the honour to be,

Sir,

Your obedient servant,

(Signed) WALTER BEATTY,

Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,

Toronto.

Appendix No. 33.

TOWNSHIP OF WABIGOON, DISTRICT OF KENORA.

TORONTO, February 4th, 1909.

SIR,—I have the honour to submit the following report of the survey of the Township of Wabigoon, in the District of Kenora, made under instructions from your Department, dated July 29th, 1909.

This township lies north of the Township of Langton and east of the Township of Smellie. The lands to the north and east are as yet unsurveyed.

In August last I took an assistant and two chainmen from Toronto, and went by train to Owen Sound, thence by boat to Port Arthur and on to Kenora by train, where I obtained good men and provisions, through the Hudson's Bay Co., and then came back by train to Vermilion Station on the C. P. Railway, from where I intended to make a start for the work by wagon, but owing to my becoming ill from poison, it was necessary for me to abandon the work for a time and come home again until I got strong enough to again go on with the work.

In the latter part of October, I again started from home by the same route as before, and arrived at the work on November the 3rd, and commenced the survey next day, using solar instruments. We had good weather, with quite a lot of sun shining for the first ten days, then it became cold and stormy with very little sun shining. The lakes and river became frozen over, so that our traversing and crossings of same were generally made on the ice.

All the posts were made of the most suitable wood to be found, of good size, sound and well marked with a scribe, and all the iron posts were well marked with a cold chisel, and placed alongside of the wooden posts where directed.

At the following points iron posts 1⅞ inches in diameter were planted:

Fifty links north from the intersection of the east boundary of the township with the northerly shore line of a bay of Wabigoon River.

At the north-east angle of Lot 1, Concession VI., marked on the south "CON. VI.", on the west "LOT 1" and on the south-west "WABIGOON."

On the north boundary Lot 12, Concession VI., sixty three links east of the intersection with the shore of the lake at the north-west corner of the township marked on the south "CON. VI." on the south "Lot 12" and on the south "WABIGOON."

On the post 1⅞ inches in diameter planted by O.L.S. J. J. Frances on the south boundary of Lot 12, Concession 1, near the intersection with Corner Lake, I marked on the north "CON. 1," "LOT 12" and "WABIGOON."

At the following points iron posts 1¼ inches in diameter were planted:

At the south-east corner of Lot 1, Concession 1, marked on the west "CON. 1," "LOT 1" and "WABIGOON."

At the north-east angle of Lot 1, Concession III., marked on the north "CON. IV.," on south "CON. III." and on west "LOT 1."

At the north-east angle of Lot 7, Concession VI., marked on the south "CON. VI.," on east "LOT 6" and on west "LOT 7."

At the north-west angle of Lot 12, Concession III., marked on the south "CON. III.," on north "CON. IV." and on east "LOT 12."

On the east boundary Lot 7, Concession I., twenty-five links north from the intersection with the shore line of Roderick Lake, marked on east "LOT 6," on west "LOT 7," on north "CON. I." and on south "31.00ch."

On the point of land on east side of Shallow Lake where the line between Lots 6 and 7 produced crosses said point, marked "VII." on west and "VI." on east.

The township generally is rough and rocky, especially along the boundaries, and the low parts are swampy.

Timber.

The timber throughout the whole township is pretty much mixed, being spruce up to ten inches in the swamps, small areas of jack pine up to ten inches on the more level portions, and small jack pine, poplar and birch on the ridges. There are a few good trees of white pine growing in the south west corner of LOT 5. Con. 5, where the engineers for the G. T. P. are camped.

Minerals.

No minerals of any economic value were found, and the needle was found to be quite steady, showing no indication of magnetic ore.

Farm Lands.

There are some good lands for agricultural purposes on Lots 4, 5, 6, 7, 8 and 9 in the southerly part of Con. 6, and Lots 3, 4, 5, 6, 7, 8, 9, Con. 5, and Lots 6, 7 and 8, Con. 4. The soil is clay and generally level. What soil there is in the rest of the township is sandy, especially in Cons. 1, 2 and 3.

Settlers.

There are several settlers in the township whose names, amount of improvements as well as the lots they wish to take up, and where they are living, are all given in forms for this purpose.

Game.

Some moose, red deer and wolves were seen, also many rabbits, partridges and ducks.

Corner Lake is being used by men engaged in the fishing business. The fish are taken to Vermilion Station on the C. P. Railway in wagons and shipped from there.

Water Powers.

There are two good water powers on the Wabigoon River, one at the crossing of the G. T. P. Railway, in the north-west corner of Lot 6, Con. 5, known as the Lower Falls.

This fall is about 18 feet high and would develop about 8,000 h.p. This is a valuable power and could be increased with a dam, which could easily be built at the head of the falls, which would back the water up into Shallow Lake, and thus give a large area for storage purposes. And I would recommend that the north-west corner of Lot 6, Con. 5, the north-east corner of Lot 7, Con. 5, the south-

west corner of Lot 6, Con. 6, and the south-east corner of Lot 7, Con. 6, be reserved for this power. There is also an additional fall of about ten feet between this fall and the north boundary of the township.

The other water power is up the river and about the middle of Lot 2, Con. 3, and known as the Upper Falls. This fall is about ten feet high and would develop about 4,000 h.p. I would also recommend that the land, both sides of the river, here, be reserved for this power.

I have the honour to be,
Sir,
Your obedient servant,
(Signed) G. S. Abrey,
Ontario Land Surveyor.

The Honourable the Minister of Lands, Forests and Mines,
Toronto.

Appendix No. 34.

Algonquin Park P. O., November 14, 1910.

The Honourable The Minister of Lands, Forests and Mines, Toronto, Ont.

Honourable Sir,—I beg to hand you report on the Algonquin National Park for 1910.

It gives your Superintendent and staff a great deal of satisfaction to know that you have during the past year visited a number of our lakes and streams, and seen for yourself the condition of at least a part of the great preserve under our care.

The work during the trapping season consisted principally of patrolling the Park. This, I feel, has been attended with good results. Several parties have been convicted and heavily fined or imprisoned, and I trust the penalties imposed will be a wholesome lesson to those who have made a practice of breaking the law by trapping and hunting in the Park. I regret to state that some of our trouble has come from lumber camps throughout the Park, and I feel that in some way the lumber firms and their foremen should be held responsible for the actions of the men in their employ. Some firms, I am glad to say, do all in their power to help us, while others do not do so.

We have had several small fires in the Park. The worst of these were caused by the Grand Trunk Railway at a point east of headquarters on the Madawaska River. While no great loss in timber was sustained, from a scenic standpoint the fire was very regrettable. Excellent work has been done by our staff in handling fires, especially the one on the mountain overlooking Cache Lake. Here every tree was fought for, and the fire was confined to a small area. In the matter of fires, I think that the railway company should exercise more caution in burning rubbish and piles of old ties along the road.

Game of all kinds is very plentiful, and is filling up the surrounding country very rapidly, especially beaver and mink; the latter being very noticeably on the increase this year. Otter, martin and fisher are also very plentiful. while deer are

in great abundance everywhere, not only in the Park, but also on all sides out of the Park limits, nearly all hunting parties getting their number in a few days. One old hunter this morning, who belongs to a party whose rule is not to kill a doe, remarked that he must have seen fifty deer in one week, while the Barnet party at Lake Louise shot eight in one day. This certainly goes to prove that the Park is a great feeder for the surrounding country.

Notwithstanding the fact that we took out over three hundred beaver over a very small area this year, I find, upon careful personal examination, that there are still a large number on the same waters. Few stop to consider how enormous must be the annual increase of wild life now over this vast area, or the valuable asset this is to the Province. I have before me a carefully prepared estimate of the number and value of the different fur-bearing animals actually sold in Canada and the United States in the five years between 1899 and 1905, all kinds of which we have here in abundance. As it may not have come under your notice, I thought it might interest you, as it shows the value of an asset that most people overlook:

Beaver	375,500	skins	valued	at	$2,290,550.
Bear	123,500	"	"	"	1,018,875.
Fisher	35,400	"	"	"	217,710.
Foxes	537,415	"	"	"	3,641,720.
Canadian lynx	266,000	"	"	"	1,662,500.
Martin	727,000	"	"	"	6,361,250.
Mink	2,525,000	"	"	"	7,196,250.
Muskrat	32,800,000	"	"	"	4,756,000.
Otter	213,000	"	"	"	2,609,250.
Raccoon	3,485,000	"	"	"	3,066,800.
Skunk	7,000,000	"	"	"	6,735,500.
Weasel and ermine	144,000	"	"	"	139,550.
Wolf	498,000	"	"	"	672,300.
Wolverine	8,350	"	"	"	47,175.

making a total of nearly forty and a half million dollars, and values have advanced very much since these dates. The above estimate is by Andersch Brothers, of Minneapolis, Minn., while the report of the United States Commission of Fish and Fisheries shows that since the year 1902 the yield of mink is of much more value than that of seal.

Fishing has been excellent during the past year. I would, however, recommend stocking Cache and White's Lakes during the coming season, as these lakes furnish sport for visitors who cannot go further afield.

Partridge and ducks are much more numerous than in former years. This year a quantity of wild rice and celery has been sown with a view to increase the food supply of ducks. Capercailzie are also increasing, and some young birds are reported seen by our rangers and others.

Visitors to the Park have been much in excess of former years.

We have erected new shelter houses at the following points: Island, McIntosh, Misty, Cedar and Eagle Lakes. These are all substantial, well-finished buildings. A good deal of trail cutting has been done and a lot of general improvements made. The houses at headquarters have been painted and enlarged. Some of my men also accompanied your bush rangers while making an estimate of the timber on the berths held by the Munn Lumber Company. This firm commenced

operations here during the past summer, and had the Department not made an effort to save the timber, not only would the beauty of the Park have been destroyed, but a slash would have been left that would make it impossible to save the balance of the woods from fire, which would mean a loss that would be hard indeed to estimate.

Our staff has been increased to twenty men, and I look for a good year's work during the coming year.

I am, Sir,
Yours very truly,
G. W. Bartlett,
Superintendent.

Appendix No. 35.

Rondeau Park,
Morpeth P.O., Nov. 14, 1910.

To the Honourable the Minister of Lands, Forests and Mines, Toronto.

Sir,—I have the honour to submit this my report as Caretaker and Ranger of the Rondeau Provincial Park for the year ending October 31st, 1910.

In looking over my last year's report, I find that some of the improvements that were suggested for the Park this season have been carried into effect, and some have been laid over for another season. We went over the road near the lake shore leading to the upper fisheries, and filled up a number of holes, thus greatly improving its condition, especially for those who frequent the road with autos and other vehicles.

The work that is being carried on at present is the levelling of the grounds around the pavilion and covering it with marsh grass. After ploughing, scraping and levelling the knolls and sand drifts, we sowed suitable grass seed (as an experiment), thinking that when it was all covered with grass a foot thick the seed would germinate and grow in the spring. This covering will help to retain the moisture that is necessary for the growth of the young grass. We are cutting and putting up a few small stacks extra of the grass, so that if any part of the present covering should wear thin by the traffic over it, we can put on more as it is required. The cost of this work will not exceed $200.00.

We covered a small patch of this sand with grass this summer, and it not only made the soft sand quite firm for walking and driving on, but the seed of the natural grass that we used to cover it with germinated and came up quite thick in places. Our experience with this small patch is what led me to recommend covering all the bare sand in this way. To cover the same ground with clay and gravel, which was at first spoken of, would cost upwards of $1,200.00. This amount of clay and gravel drawn over the Park road (which is in excellent condition now) would, in all probability, cut it up so that it would have to be re-gravelled; but as it is now, all the road will require for 1911 will be to go over it with the heavy road scraper in the spring.

The repairs that we put on the Park dock last year are in very good condition as yet. The muskrats made a little trouble on the low dock or sand approach. The life preservers served an excellent purpose this season; they were the means of preventing two or three drowning accidents.

We fully expected to have had the pavilion overhauled and put into good condition this season, and I would renew my recommendation that this be speedily done. Owing to the bad condition of the floor, posts, railing, etc. (being decayed or badly worn), it has not been used nearly so much this season as it was in former years. I would urge the Department to have this building thoroughly overhauled early next spring, and have it put in good condition by the first of June.

Another very necessary work that would benefit the Park and would add to the comfort and health of its visitors, is a ditch or drain to be dug from the big slough or swale across the ridges, emptying into the Eau, a short distance south of the summer cottages. This swale is flooded nearly every spring, causing a breeding ground for mosquitoes, and also injuring the drinking water in the wells close by. A 12-inch tile carefully put in would carry off all the flow of water if a small dam, say, two feet high was raised to force the water through in case of an extra heavy flow. This would not cost much in proportion to the benefit that would accrue. The Department has given every encouragement and all the assistance possible towards getting a sufficient supply of good wholesome drinking water for the Park. Under their direction a deep well was sunk to the soapstone rock, and water was found, which, after examination by Dr. Amyot, Director of the laboratory of the Provincial Board of Health, Toronto, was pronounced of good quality; but it seems that the steel shoe on the casing was not located properly on or near the rock, so as to prevent the gravel and sand getting in at the bottom and stopping the free flow of water into the pipe. We have a deep well expert working at it now, and he is satisfied that the well will give us plenty of water when he gets through with it. If the well proves satisfactory I would urge that the Department go on and put in the proposed water system on the Park for next season.

We finished claying the base ball ground this spring, and put it into good condition at a cost of $150.00.

It has been strongly urged, especially by people who visit the Park in autos and those who take an interest in the Park forest, that a good drive road be built and maintained through the north-westerly part of the forest, beginning where the good road into the Park now ends, and continuing through the bush to the bar, and along the bar about half a mile or less, which would meet the south or Lake Shore road, thus forming a belt line around the Park. This would make one of the most beautiful and popular driveways in this western peninsula.

Mr. Arthur Orendorf has, as usual, given very satisfactory service in the refectory this season, catering to the wants of those who visit the Park; also the boat livery service was very satisfactorily managed by Mr. F. Weir. He built a small temporary addition to his boat-house for bathers (men and boys) to go into and change their garments, and he also kept a supply of bathing suits for hire. The number of visitors seems to be increasing each year. This is becoming a favourite spot for automobile parties from the surrounding country and towns.

The herd of deer running at large in the wooded portion of the Park has largely increased, and must now number at least one hundred individuals. They may frequently be seen coming down in the evenings to feed on the open grounds in front of the Ranger's house, returning to the forest in the morning.

I have the honour to be,
Sir,
Your obedient servant,
ISAAC GARDINER,
Ranger.

Appendix No. 36.

Survey of Township Outlines in the Porcupine Mining Division, Temagami Forest Reserve.

Sault Ste. Marie, Ont., August 9th, 1910.

Sir,—I have the honour to submit the following report upon the survey of certain township outlines in the Porcupine Mining Division, in the Temagami Forest Reserve, made by me under instructions from your department, dated April 28th, 1910. The survey was commenced early in May and carried on as rapidly as circumstances would permit, and completed early in July

Our first meridian line was run due south astronomically 24 miles from the 18th mile post on O. L. S. Niven's first base line.

Our second meridian line was run south 6 minutes west astronomically 11 miles and 79 chains; thence south 6 minutes east astronomically 12 miles, 2 chains and 90 links.

Our first base line was run from a point on our first meridian line 6 miles south of O. L. S. Niven's first base line, due west astronomically 6 miles, 1 chain and 80 links, to our second meridian line, and due east astronomically from the said point 5 miles, 79 chains and 20 links to O. L. S. Watson's meridian line.

Our second base line was run from a point on our first meridian line 12 miles south of O. L. S. Niven's first base line, due west astronomically 6 miles, 3 chains and 62 links, and due east astronomically 6 miles, 1 chain and 58 links.

Our third base line was run from a point on our first meridian line 18 miles south of O. L. S. Niven's first base line, due west astronomically 6 miles and 70 links, and due east from the said point 6 miles, 2 chains and 37 links.

Our fourth base line was run from a point on our first meridian line 24 miles south of O. L. S. Niven's first base line, due west astronomically 5 miles, 78 chains and 10 links, and due east astronomically from the said point 6 miles, 3 chains and 16 links.

At the south-east corner of the Township of Ogden, we intersected O. L. S. Watson's westerly meridian line 95 links north of his iron corner post. At the south-east corner of the Township of Price we intersected O. L. S. Watson's westerly meridian line 6 miles, 1 chain and 50 links east of our first meridian line measured along the base line. O. L. S. Watson's line had not been chained.

At the south-east corners of the Townships of Fripp and Musgrove we cut our line beyond our corner posts unblazed as O. L. S. Watson's meridian line, which forms the westerly limits of these townships, had not yet been run.

We encountered none of O. L. S. Beatty's lines.

Physical Features.

In general, the surface of the country west of the Mattagami River is level and swampy, and to the east it is very rough and rocky.

East of our first meridian line all the exposures of rock are schist, and west of this line what few exposures we met with are granite; none of the mining claims in the territory traversed have been surveyed. In fact, only on the east side of the Grassy River did we intersect any lines.

Timber.

The timber consists chiefly of jack pine, spruce, balsam and birch, with a preponderance of jack pine and spruce. The whole area is heavily timbered wih the exception of about 6 square miles in the extreme south of the Township of Musgrove, which was burnt clean in 1896. The jack pine and spruce are large; on the average 10 inches in diameter. There is only an occasional white or red pine tree, and in no place is there a stand of any commercial value.

Waters.

The Mattagami River runs north through the middle of the Townships of Doyle, McKeown, Thornloe and Bristol. It takes the form of a lake (Kenogamisee Lake) to within 2 miles of the north boundary of the Township of Thornloe. At this pointe the Wawaitan Rapids occur. Here there is a drop of 28 feet in about a mile. Below this point the river winds through high sand banks in a northerly direction and crosses O. L. S. Niven's first base line 1½ miles east of the 18th mile post. The average rate of the stream in this lower section is about three miles an hour.

The Grassy River runs north almost parallel to the first meridian at a distance of 1½ miles east of it, and joins the Mattagami River a quarter of a mile below the south-west corner of the Township of Ogden. At the point where the boundary line between the Townships of Fripp and Price crosses the river two miles east of our first meridian line, there is a rapid and a fall amounting to a drop of 80 feet; above this point the river runs smoothly, but below it to the junction with the Mattagami River the rate of the stream is about 4 miles an hour.

The Papagamika River is a crooked but navigable stream running north through the eastern part of the Townships of Price and Ogden; it enters the Mattagami River about 3 miles below O. L. S. Niven's first base line.

The Split Rock River (Katashkashabika River) is a navigable tributary of the Papagmika River running parallel to it to the west and joins it somewhere in the Township of Ogden.

The Red Sucker River (Misqwamabinagenda River) rises in a lake of the same name 10 miles or so west of Kenogamisee Falls on the Mattagami River. It runs across the north-west corner of the Township of Thornloe and into the Township of Bristol, joining the Mattagami River at the south-east corner of the latter township. During its course through these two townships it is one continuous rapid. About 5 miles from the mouth of the river there is a fall of 12 feet.

There are no lakes in the area embraced worthy of mention.

Fish and Game.

In all the rivers and lakes, large and small, whitefish, pickerel, pike and perch are very plentiful. Below Wawaitan Rapids on the Mattagami River and below the high falls on the Grassy River speckled trout averaging 3 pounds are in abundance. Lake trout are caught, to our knowledge, only in Kanamekosike Lake, which is 3 miles due west of the Wawaitan Rapids on the Mattagami River.

There are large numbers of moose over the entire area and caribou are fairly plentiful in the eastern section of the Townships of Ogden and Price. Partridge are very plentiful this season.

Accompanying this report we submit plans and field notes and also accounts in triplicate.

We have the honour to be,

Sir,

Your obedient servants,

(Signed) LANG and Ross,

Ontario Land Surveyors.

The Honourable, the Minister of Lands, Forests and Mines,
Toronto, Ont.

Appendix No. 37.

List of Persons holding Cullers' Licenses, issued under the Ontario Cullers' Act, up to 31st October, 1910.

Name.	P. O. Address.	Name.	P. O. Address.
Anderson, M. M.	Almonte.	Brandon, Martin W.	Peterborough.
Allan, James D.	Bracebridge.	Bell, John C.	Peterborough.
Appleton, Erwin B.	Bracebridge.	Bartlett, George W.	Warren.
Albert, Andrew	Ottawa.	Brown, Silas	Klock's Mills.
Adams, J. Q.	Longford Mills.	Boland, W. G.	Eganville.
Anderson, Patrick J.	Campbellford.	Baulke, George R.	Aylmer, Que.
Anderson, J. C.	Gravenhurst.	Bouchey, Arthur	Massey.
Allan, Alfred	Ottawa.	Buchanan, Mark	Trout Mills.
Allen, R. A.	Bannockburn.	Barrett, W. J.	Thessalon.
Aikins, Geo. M.	French River.	Bromley, Thomas	Pembroke.
Appleby, Ridley	Katrine.	Bremner, John L.	Admaston.
Adams, James M.	Sault Ste. Marie.	Breen, Bernard	Garden River.
Aylward, James	Peterborough.	Buie, Dougal	Providence Bay.
Archibald, John L.	Keewatin.	Baker, Thomas	Blind River.
Austin, Wm. G.	Renfrew.	Blais, Felix	Hull, Que.
Anderson, Charles	Little Current.	Balsdon, George	Keewatin.
Anderson, John	Cartier.	Bromley, W. H.	Pembroke.
Adair, Thomas Albert	Gananoque.	Bowers, Isaac	Little Current.
Anderson, J. G.	Alpena, Mich.	Brown, Thomas	Barrie.
Alexander, Samuel	Arden.	Bass, Walter R.	W. Huntingdon.
Adams, Wm.	Westmeath.	Bates, Robert	Kenora.
Arkle, George	Kenora.	Binnie, Thomas	Port Arthur.
Armstrong, Jas. Theodore	McKellar.	Blair, William	Keewatin.
Armstrong, Thomas J.	Arnprior.	Bick, Thomas	Bobcaygeon.
Acheson, Ira M.	Westmeath.	Burke, John Thomas	Midland.
Albert, Alfred E.	Ottawa.	Buchan, Sterling	L'Original.
Alma, John E.	Hawkesbury.	Brown, Joseph A.	Spanish.
Adams, George A.	Longford.	Baird, P. C.	Rainy River.
Ansley, John Albert	Thessalon.	Brill, J. W.	Mine Centre.
Ansley, John Jenkins	Thessalon.	Beattie, Arthur W.	Arnprior.
Ainslie, Alexander	Spanish.	Brock, H. S.	Ottawa.
Apleton, E. A.	Kenora.	Benson, John Bird	Midland.
Arnill, William	Iron Bridge.	Brennan, Rich'd Lawrence	Peterborough.
Adams, Fred	L'Original.	Brown, Hugh Riside	Huntsville.
Alexander, R. Harvey	Spragge.	Bryan, Frank	Keewatin.
Alexander, J. Albert	Spragge.	Bennett, Edward Clinton	Ahmic Harbour.
Ainslie, Donald McF.	Whitestone.	Blaine, Harvie Thomas	Orillia.
Ansley, William	Thessalon.	Barrett, Thomas	Barrie.
		Bickell, James Manuel	Sault Ste. Marie.
Brophy, Michael Patrick	Massey Station.	Buisson, William	Sudbury.
Boland, Abraham	Cartier.	Borrett, James A.	Sault Ste. Marie.
Brown, Singleton	Bracebridge.	Bliss, C. Lidden	Sudbury.
Barry, Thomas James	Hastings.	Bray, James	Kinmount.
Blanchet, Paul Fred'k.	Ottawa.	Bremner, George	Arnprior.
Bird, W. S.	Parry Sound.	Bromley Samuel	Pembroke.
Bayley, James T.	Gravenhurst.	Brown, A. C.	Fitzroy Harbour.
Bell, Henry	Ottawa.	Berlinquet, Julius	Opimicon, Que.
Beach, Herbert Mahlon	Ottawa.	Blastorah, Fred L.	Harwood.
Barry, Thomas	Millbridge.	Burns, Clifton H.	Little Current.
Beatty, W. R.	Parry Sound.	Beaumont, Ernest	Parry Sound.
Brooks, Frederick Wm.	Mackay's Station.	Beattie, Alex.	Whitney.
Brown, Robt. D.	Port Sidney.	Brennan, Reginald	Gravenhurst..
Breed, Arthur G.	Penetanguishene.	Boyd, George	Gravenhurst..
Barnes, Thomas Geo. Lee	Muskoka Mills.	Bissell, Geo. Thomas	Trenton.
Buchanan, Robert	Coldwater.	Baxter, Richard	Deseronto.
Beck, Jacob Frederick	Penetanguishene	Breeaugh, Edward	Deseronto.
Bird, Joseph Manly	Muskoka Mills.	Boyd, Geo. A.	Thessalon.
Boyd, John F.	Thessalon.	Buchan, Frederick	Arnprior.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Barrett, Patrick	Arnprior.	Cain, Robert	Midland.
Brundage, Alfred W.	Pembroke.	Crawford, Stephen W.	Thessalon.
Brougham, Thomas	Eganville.	Cochrane, George	Peterboro.
Blair, Robert I.	Arnprior.	Coburn, John	Lindsay.
Benson, John W.	Sturgeon Bay.	Crowe, Nathaniel	Bobcaygeon.
Beck, Chas. M., Jr.	Penetanguishene.	Cameron, Alexander	Norman.
Beatty, W. J.	Coldwater.	Chrysler, Frank R. L.	Webbwood.
Burns, C. W., Jr.	South River.	Callaghan, Thomas, Jr.	Campbellford.
Bell, John Henry	Burk's Falls.	Carson, Hugh	Kenora.
Berry, Harold	Labelle, Q.	Calder, George	Woodville.
Black, George	Barwick.	Callaghan, Dennis	Campbellford.
Bettes, John Hiram	Muskoka Mills.	Corrigan, Robt. T.	Emo.
Brady, John	Renfrew.	Cameron, John H.	Kenora.
Brown, James	Buckingham, Q.	Carson, Melvin	Little Current.
Brooks, W. J.	Blind River.	Cameron, John K.	Spanish River.
Bertrand, Allan	Nairn Centre.	Cassidy, William	Little Current.
Brinkman, Alex. B.	Sault Ste. Marie.	Coons, Geo. Washington	Peterboro.
Black, Jacob	Barwick.	Chisholm, Geo. Leopold	Sault Ste. Marie.
Beattie, W. J.	Arnprior.	Clark, Wm. J.	Birkendale.
Bromley, William	Westmeath.	Carr, Herbert E.	North Bay.
Bissell, Hartie	Trenton.	Cochrane, Alfred L.	Muldoon, Que.
Brown, Robert	Starrat.	Campbell, George	Fort Frances.
Beaton, Hugh	Waubaushene.	Chalmers, George James	Peterboro.
Bailey, Arthur	Parry Sound.	Caverly, David Charles	Parry Sound.
Burd, James Henry	Parry Sound.	Campbell, Archibald J.	Little Current.
Bailey, Samuel James	Orillia.	Close, John L.	Arnprior.
Burton, Tinswood	Renfrew.	Carmichael, Donald	Arnprior.
Boyes, James	Huntsville.	Carty, John	Arnprior.
Brown, John	Rockdale.	Cleary, Patrick M.	Arnprior.
Brennan, Edward Scott	Sundridge.	Caldwell, James M.	Callender.
Bell, John Arguey	Klock's Mills.	Cushing, John J.	Davidson, Que.
Bromley Edw. H.	Pembroke.	Crebo, William	Thessalon.
Bliss, Lawrence E.	Byng Inlet.	Cullen, Michael J.	Massey Station.
Buee, Neil	Spanish Station.	Cuthbertson, William	Arnprior.
Brazziel, Leonard	Spanish Station.	Carss, Percy	Thessalon.
Bowie, James	Bryson, Que.	Coghlan, Michael	Chapeau, Que.
Barrie, Nicholas J.	Ottawa.	Cameron, Alexr. Gordon	Beauchene, Que.
Burke, J. D.	Kenora.	Cassaday, W. W.	Emo.
Bowen, Thomas	Deseronto.	Carter, Robert E.	Fesserton.
Brown, James F.	Baysville.	Coleman, Jos.	Baysville.
Blastorah, Bernard	Harwood.	Cardiff Geo. McDougall	Sudbury.
Brannan, William H.	Pembroke.	Cameron, W. D.	Kenora.
Bromley, Thomas	Webbwood.	Crandall, F.	Port Arthur.
Barr, J. C.	Fort Frances.	Campbell, James R.	Eganville.
Bradley, J. M.	Mine Centre.	Campbell, John A.	Galleta.
Burns, Dominick	Webbwood.	Caillier, Hyacinth	Arnprior.
Blaikie, Campbell D.	Fort Frances.	Chamberlain, Thomas	Bobcaygeon.
Bury, Henry J.	Stratton.	Cooper, David Allan	Millbrook.
		Cox, Henry	Ballerica, Que.
Campbell, Robert John	Flinton.	Currie, James	Ottawa.
Carpenter, John A.	Arnprior.	Clarkson, A. E.	Midland.
Campbell Alex J.	Trenton.	Clairmont, E.	Gravenhurst.
Carson, James	Bracebridge.	Cameron, W. F.	Sturgeon Bay.
Campbell, J. M.	Bracebridge.	Connolly, David	Gravenhurst.
Campbell, Robert	Bracebridge.	Campbell, P. C.	Sault Ste. Marie.
Clairmont, Joseph	Campbellford.	Cadenhead, Alexander	Midland.
Clarkson, Robert J.	Parry Sound.	Carpenter, R. J.	Arnprior.
Carruthers, Aaron	Hintonburg.	Christie, William Pringle	Severn Bridge.
Calder, Wm. J.	Bark Lake.	Campbell, C. V.	Sault Ste. Marie.
Chew, Joseph	Gravenhurst.	Clegg, Samuel	Peterboro.
Cole, James Colin	Ottawa.	Clairmont, William L.	Gravenhurst.
Cameron, Wm.	Collin's Inlet.	Cook, Sydney P. W.	Spanish Station.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Corrigan, John	Baysville.	Donally, Richard S	Sudbury.
Chalmers, Alexander M	Peterboro'.	Devine William	Cook's Mills.
Charlton, George A	Collingwood.	Durrill, William	Nosbonsing.
Cahill, Thomas	Nosbonsing.	Draper, Patrick	Quyon, Que.
Chew, Manley	Midland.	Davis, J. P	Bobcaygeon.
Cooper, James Eddly	Saurin.	Dale, John Alexander	Birkendale.
Cook, Reinhardt	South River.	Dinsmore, Chas. L	Huntsville.
Crowe, Cecil	Bobcaygeon.	Drum, Patrick	Belleville.
Callaghan, Dennis	Trenton.	Durham, Edgar S	Rosseau.
Collins, James	Barryville.	Duquette, Chas.	Webbwood.
Claffey, Edward D	Fort William.	Davis, William Albert	Bobcaygeon.
Coyne, Phin	Chelmsford.	Dickson, Robt. Alexander	Keene.
Constantine, Eudore	Blind River.	Dawkins, John	Gravenhurst.
Cameron, Ewan	Gordon Lake.	Doxsee, James E	Gravenhurst.
Campbell, Daniel N	Buckingh'm, Que.	Didier, L. P	Aylmer, Que.
Canniff, R. W	Kenora.	Devine, Patrick J	Sheenboro, Que.
Cassidy, S. C	Dunchurch.	Dinsmore, Richard	Huntsville.
Charleston, John Baptiste	Ottawa.	Dunn, Percy E	Longford Mills.
Comer, Billa F	Tweed.	Duval, Chas	Halfway.
Carter, George	Sundridge.	Donlevy, James	Calabogie.
Corrigan, Robt. J.	Emo.	Doris, Patrick	Peterborough.
Caswell, Grant	Coldwater.	Doris, John	Peterborough.
Caswell, Geo	Coldwater.	Donahue, Michael	Erinsville.
Chemir, David A	Pembroke.	Doran, W	Belleville.
Clairmont, Philadelp L	Gravenhurst.	Dickson, Robert R	Kippewa, Que.
Crowe, Edgerton	Bobcaygeon.	Donlevy, Wm. C	Rockcliffe.
Castonquay, A. C	Chelmsford.	Duff, Chas. A	Stewartville.
Clark, Donald Allan	Port Arthur.	Dean, James C	Kenora.
Charette, Herbert	Devlin.	Duff, Peter A	Claybank.
Christie, Uriah W	Fort Frances.	Duncan, Downey	Rainy River.
Clark, Joseph C	Fort Frances.	Dougherty, J. M	Fort Frances.
Crowe, Leslie	Bobcaygeon.	Dunn, John F	Spanish Mills.
Campbell, Duncan W	Stewartville.	Dyke, Morris F	Blind River.
Callahan, Thomas N	Arnprior.	Devitt, Frank	Dinorwic.
Clements, Albert James	Bent River.	Dickie, David	Port Arthur.
Carney, Albert	Sault Ste. Marie.	Dupuis, Alfred	Keewatin.
Collins, Arthur	Massey Station.	Devlin, Samuel	Spanish Mills.
Carter, George	Lavelle, Que.	Dougherty, W. H.	McLaren's Bay.
Chitty, Alfred E	Kenora.		
Cardiff, Richard J	Arnprior.	Enlaw, Oliver	Campbellford.
Conway Thomas	Barry's Bay.	Ebert, Andrew P.	Pembroke.
Costello, Thomas M	Antrim.	Ellis, Alexander	Arnprior.
Cross, R. J.	Silver Islet.	Ellis, John	Westmeath.
Clark, R. H.	Port Arthur.	Errington, Joseph	Sundridge.
Clark, Wm. R.	Port Arthur.	Eddington, Henry John	Parry Sound.
		Enright, Daniel	Port Arthur.
Didier, Hector	Mattawa.	Eager, James	Parry Sound.
Doran, Frank	Barryvale.	Elliott, Porter P	Mine Centre.
Dunning, E. Percival	Parry Sound.	Elliott, William	Cache Bay.
Duff, R. J.	Arnprior.	Edgar, J. E	Rat Portage.
Durrill, John W	Ottawa.	Elliott, George E	Peterborough.
Dickson, John	Sundridge.	Edwards, Joseph K	Gillies' Depot.
Dickson, James L	Michipic'ten H'r.	Eldridge, Robert	Fort Frances.
Dobie, Harry	Sault Ste. Marie.		
Deacon, Charles	Sault Ste. Marie.	Fraser, John A	Kenora.
Danter, R. W	Parry Sound.	Ferguson, Wm. H	Red Bay.
Doyle, T. J	Eau Claire.	Forbes, Chris. McKay	McLean's Depot.
Dobie, Alexander R	Blind River.	Fitzgerald, E. Clair	Parry Sound.
Darling, J. M	Wisawasa.	Farrell, W. H	Ironside, Que.
Dillon, John	Calabogie.	French, Lewis William	Byng Inlet.
Durrell, Jos. Nelson	P'rt'ge du F'rt, Q.	Fraser, William A	Mattawa.
Durrell, John	Callender.	Finerty, Patrick	Rochfort.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Farnand, Frank	Diamond.	Green, Samuel E	Parry Sound.
Fulton, Philip S	Spanish Station.	Grant, John	Flinton.
Fitzgerald, Ullyot C	Parry Sound.	Green, Arthur	Ottawa.
Fenn, George	Bracebridge.	Green, Norman McL	Bancroft.
Fortune, Owen	Trenton.	Gillis, John J	Whitefish.
Fraser, David	Norman.	George, R. W.	Parry Sound.
France, John	Collin's Inlet.	Gardiner, John	Parry Sound.
Ferguson, Ernest A	Baysville.	Golden, Frank J	Trenton.
Ferguson, Alpen	Mattawa.	Garson, Robert	Thessalon.
Ford, John William B	P'r'tge du F'rt, Q.	Gropp, August	Penetanguishene.
Ford, Charles	Wahnapitae.	Grozelle, Antoine D	Muskoka Mills.
Findlay, J. H	Braeside.	Goulais, James	Peterborough.
Fraser, James	Renfrew.	Grayson, Charles	Keewatin.
Fairen, Francis	Peterborough.	Gladstone, Harry E	Cook's Mills.
Faulkner Jos	Fesserton.	Guertin, Oliver	Biscotasing.
Fraser, Alexander, Jr	Westmeath.	Gelinas, Frank	Hull, Que.
Fairbairn, William	Calabogie.	Gwynne, John	Hawkesbury.
Fraser, Wm. A	Pembroke.	Gray, Frederick M	Brule Lake.
Fraser, Foster	Pembroke.	Graham, Edward G	Wahnapitae.
Fraser, Wm	Little Current.	Griffin, James	Spanish River.
Fraser, Hugh Alexander	Pembroke.	Gordon, Alexander B	Pembroke.
Flaherty, John	Lindsay.	Gareau, Noah J	Pembroke.
Fisher, Wm	Trenton.	Gillies, D. A	Carleton Place.
Fox, Thomas	Deseronto.	Gilligan, Edward	Mattawa.
Fallis, James W	Sturgeon Bay.	Gladman, Charles	Parry Sound.
Fairbairn, N. H	Webbwood.	Garrow, John D	Ottawa.
Friel, John	Trenton.	German, William Burton	Wahnapitae.
Fox, Charles	Trenton.	Gordon, Robert W	Pembroke.
Featherstonehaugh, W. H	Penetanguishene.	Guertin, Nelson	Petawawa.
Friar, Schuyler	Westmeath.	Gardner, John	Kenora.
Farren, Joel	Savanne.	Gunter, Peter M	Gilmour.
Fraser, Duncan	Big Forks.	Glennie, William	Millbridge.
Freestone, Walter	Burk's Falls.	German, Maurice J	Fenelon Falls.
Fraser, John	Bancroft.	Gillies, John A	Braeside.
Fitzgerald, D.C	Spanish Station.	Goddin, Edward	Griffith.
Foster, Wm. C	Searchmont.	Grant, Joseph	Eganville.
Frazer, Jas. C	Spanish Mills.	Gilmour, James B	Braeside.
Fremlin, H. P	Richards' Land'g.	Gorman Joseph P	Sault Ste. Marie.
Foster, Ed. G	Sault Ste. Marie.	Gordon, Thomas A	Hall's Bridge.
Farrel, Peter M	Whitefish.	Gray, Albert H	Biscotasing.
Fairhall, Edward	Whiteside.	Gadway, John	Parry Sound.
Fraser, Levi	Bracebridge.	Garrow, Edward	Webbwood.
Fiddes, James	Rainy River.	Golding, William	Dorset.
Frawley, Frank	Orillia.	Gillies, Harry	White Lake.
Fisher, George	Sault Ste. Marie.	Gordon, Herbert C	Nelson.
Filiatrault, J. A	Blind River.	Gillespie, M. H	Cook's Mills.
Farrier, John William	Chapleau.	Griffin, William	Huntsville.
Finney, Benjamin B	Fort Frances.	Ganton, David	Trout Creek.
Follis, Frank C	Hawkesbury.	Graham, George L	Arnprior.
Fortune, Percy H	Blind River.	Graham, Frederick S	Arnprior.
Fraser, Wm. Foster	Sault Ste. Marie.	Gill, Cuthbert	Orillia.
Fraser, Allan H	Thessalon.	Graham, James Robert	Kenora.
Farquharson, James	Tomiko.	Graham, Thomas Jordan	Byng Inlet.
Fink, John	Mattawa.	Gaudaur, Antoine Daniel	Orillia.
		Gorman, Patrick	Eganville.
Griffith, Geo. F	Pembroke.	Guy, Charles	Fort Frances.
Graham, John	Arnprior.	Graham, George H	Gillies Depot.
Golden, John	Gilmour.	Greer, George P.	Port Arthur.
Gunter, Henry M	Trenton	Gill, Charles	Fort Frances.
Goltz, Ernest	Bardsville.	Gamey, William H	Englehart.
Green, Forman A	Gilmour.	Gorman, Michael J	Diver.
		Grier, Roy B	Kenora.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Greer, Samuel H.	Gore Bay.	Howard, William.	Baysville.
Gilbert, Sidney N.	Rainy River.	Hogan, Enos W.	Savanne.
		Horne, John T.	Fort William.
Hale, Thomas.	Pembroke.	Hamilton, Chas. E.	Kenora.
Hogan, Albert J.	Sault Ste. Marie.	Henderson, Leonard.	Baysville.
Hagen, Edmund G.	Little Rapids.	Hunter, Thos.	Callender.
Hagen, Wilson.	Thessalon.	Hamilton, Robert J.	Ottawa.
Hurd, Cyrus.	Parry Sound.	Hawkins, William A.	Pembroke.
Henderson, Albert E.	Burford.	Herring, Edward C.	Sebright.
Hale, John B.	Sault Ste. Marie	Hatch, J. W.	Dryden.
Hickerson, Melvin T.	Fort Frances.	Hoard, Wm. Paris.	Emo.
Howey, George H.	Fort Frances.	Hartman, W. R.	Blind River.
Hartt, James.	Gilmour.	Hill, Ernest L.	Hawkesbury.
Hayes, James.	Enterprise.	Hall, Samuel S.	Marmora.
Humphrey, T. W.	Gravenhurst.	Hasleton, Constantine	Killaloe.
Huckson, A. H.	French River.	Hamilton, A. J.	Spragge.
Handley, Robert.	Douglas.	Heggart, E. C.	Trout Mills.
Howe, Alexander.	Queensborough.	Hunt, Ronald E.	Massey.
Hurd, Edwin.	Hurdville.	Hurd, Asahel.	Parry Sound.
Huff, J. S. Morris.	Arnprior.	Howe, Peter	Fort Frances.
Halliday, Robert J.	Lindsay.	Hammond, Samuel H.	Fort Frances.
Hutton, John.	Hutton House.	Hunt, Alex. D.	Pearl River.
Hutchinson, Wm. E.	Huntsville.		
Hogarth, Joseph Rowan.	Pembroke.	Irving, Thos. H.	Parry Sound.
Humphrey, John.	Gravenhurst.	Irwin, Eli.	Kenora.
Hill, Joshua.	Midland.	Irving, Edward C.	Kenora.
Hall, David.	Lovering.		
Hartley, Charles.	Peterborough.	Johnston, Ralph E.	Port Arthur.
Hawkins, Henry Chas.	Blind River.	Johns, Frank A.	Toronto.
Hines, Philip Wallace.	Huntsville.	Jackson, Robert.	Brechin.
Hudson, John Lewis.	Combermere.	Johnson, Finlay.	Bracebridge.
Hurdman, William H.	Ottawa.	Jones, Albert.	Victoria Harbor.
Hughes, John.	North Bay.	Johnson, Thomas.	Bobcaygeon.
Howie, R. G.	New Liskeard.	Johnston, Archibald M.	Norman.
Helferty, Dennis.	Eganville.	Julien, Charles.	Trenton.
Hamilton, Robert.	Kenora.	Junkin, Henry.	Marmora.
Hoppins, Abiram.	Kingston.	Johns, Frank.	Nipissing Junct'n.
Hoppins, Densmore.	Kingston.	Jessup, Edward D.	Cache Bay.
Haystead, John.	Parry Sound.	Johnson, Frank N.	Ottawa.
Henderson, John Irwin.	Bobcaygeon.	Johnston, John.	Peninsular Lake.
Hartley, William.	Millbridge.	Johnson, S. M.	Arnprior.
Higgins, John C.	Peterborough.	Jones, Frederick James.	Flinton.
Harrison, John, Jr.	Pembroke.	Johnston, William A.	Castleford.
Hawkins, E.	La Breton Flats.	Jervis, Henry.	Wisawasa.
Henderson, Charles.	Bracebridge.	Jones, William.	Fenelon Falls.
Halliday, Frank.	Parry Sound.	James, Martin.	The Flats.
Hammond, W.	Orillia.	Johnston, James	Fort Frances.
Hall, Charles Asa.	Penetanguishene.	Johns, Alexander.	Callender.
Hearl, John.	Callender.	Jackson, John A.	Barwick.
Howe, Isaac.	Fort Frances.	Johnson, Thomas.	Fort Frances.
Halliday, James.	Springtown.	Johnston, George N.	North Bay.
Hurdman, J. A.	Ottawa.		
Hawkins, Stonewall J.	Meldrum Bay.	Kintree Stuart.	Little Rapids.
Hinchcliffe, William	Gunter.	Kerby, John	Belleville.
Henderson, Arthur.	Baysville.	Kennedy, Robert.	Marmora.
Hillis, James M.	Sutton West.	Kirby, Louis Russell.	Ottawa.
Harris Wm., Jr.	Day Mills.	Kennedy, Timothy.	Enterprise.
Hogg, W. J.	North Bay.	Kirk, Henry	Trenton.
Hoxie, E. P.	Katrine.	Knox, Milton.	Ottawa.
Hawkins, Walter.	Pembroke.	Kinsella, Michael Pierce.	Trenton.
Howard, James.	Eganville.	Kitchen, D.	French River.
		Kelly, Jeremiah.	Sudbury.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Kelly, Ferdinand	Mattawa.	Lowe, Thomas A.	Renfrew.
Kennedy, T. J.	Arnprior.	Livingston, Robert M.	Huntsville.
Kenning, Henry	Pembroke.	Londry, William E.	Sault Ste. Marie.
Kirby, D. F.	Belleville.	Labelle, James	Waltham, Que.
Kirkpatrick, David	Lindsay.	Labelle, Eli	Waltham, Que.
Kean, John F.	Orillia.	Ladurante, J. D.	Ottawa.
Kellett, Fred	Keewatin.	Ludgate, Theodore	Peterborough.
Kelly, Michael J.	Baysville.	Lucas, Frank	Sault Ste. Marie.
Kirk, William James	Webbwood.	Lunam, Duncan	Collfield, Que.
Kerr, E. G.	Thessalon.	Lott, George	Trenton.
King, Napoleon	Mattawa.	Lawrie, John D.	Parry Sound.
Kean, B. F.	Orillia.	Lovering, George Francis.	Coldwater.
Kemp, Orval Wesley	Trenton.	Lucas, R. G.	Christina.
Kirk, Charles Barron	Queensborough.	LeBlanc, Edmund C.	Chapleau.
Kingsland, W. P.	Ottawa.	Lavigne, John	Aylmer, Que.
Kerr, John B.	Arnprior.	Landell, Charles S.	Huntsville.
Kennedy, Walter	Arnprior.	Long, Henry Elisha	Mattawa.
Kennedy, John	Pembroke.	Lynch, W. H.	Collingwood.
Knox, Wm. M.	Fesserton.	Laplante, Francis	Byng Inlet.
Kingston, Robert	Wisawasa.	Lindsay, James	Arnprior.
Kearnan, Edward	Blind River.	Labelle, Michael	Arnprior.
Kearney, Michael John	Buckingham, Qu.	Legree, John	Dacre.
Kendrick, John	Burk's Falls.	Legree, James L.	Calabogie.
Kendrick, John L.	Burk's Falls.	Leigh, John Chas	Gravenhurst.
Kennedy, John W.	Ottawa.	Lloyd, Edward B.	King.
Kelly, James F.	Trout Creek.	Lemyre, Bruno	Gravenhurst.
Kauffman, Julias	Blind River.	Lavelle, Charles H.	Canoe Lake.
Kennedy, Sylvester	Brule Lake.	Lyons, James	Waltham Sta., Q.
Kernahan, George A.	Barwick.	Ledwood, Charles	Ottawa.
Kehoe, Martin	Huntsville.	Levelle, Emrey	Waltham Sta., Q.
Kennedy, Daniel J.	Spanish.	Little, Theo.	Kenora.
		Lehman, Joseph	Stratton Station.
Leannoth, Francis	Arnprior.	Lafare, Mark	Cache Bay.
Lee, James	Warren.	Leach, George	Vermilion Bay.
Lloyd, Alfred	Severn Bridge.	Lott, Angus M.	Spanish Mills.
Lawrie, Frank A.	Parry Sound.	La Belle, Ambrose	Kenora.
Latimer, Jas.	Frank's Bay.	La Breen, Douglas	Kenora.
Lemyre, Middey	Campbellford.	Lavelle, Michael J.	Blind River.
Lutz, Jacob	Parry Sound.	Lyleton, J. E.	Parry Sound.
Luby, John E.	Ottawa.	Lalor, William J.	Aspdin.
Law, Wm. J.	Markstay.	Lalonde, Joseph Maxine	Link.
Lummis, Daniel	Glanmire.	Laderoute, Michael	Arnprior.
Lowe, W. C.	Port Arthur.	Leroy, Levi H.	Port Arthur.
Londry, S. C.	Sault Ste. Marie.		
Lochnan, James	Ottawa.	Malloy, Mark	Baysville.
Link, Henry W.	Ottawa.	Martin, Hugh	Sault Ste. Marie.
Ladarotte, John	Arnprior.	Miller, R. O.	Gravenhurst.
Lochnan, John	Aylmer, Que.	Morrison, James	Toronto.
Lozo, John	Trenton.	Murray, Frederick	Huntsville.
Loughrin, Lawrence	Pembroke.	Menzies, Archibald	Burk's Falls.
Linton, J. H.	Parry Sound.	Manning, James	Trenton.
Ludgate, James	Peterborough.	Martin, Philip	Stoco.
Lee, Robert	Huntsville.	Malone, Wm. Patrick	Ottawa.
Langford, Mark	Baysville.	Marsh, Esli Terrill	Trenton.
Letherby, Edwin	Midland.	Miller, John W.	Huntsville.
Leahy, Francis M.	Chapeau, Que.	Muchinbacker, Asa	Rosseau Falls.
Langford, Henry	Baysville.	Morris, Geo. F.	French Bay.
Lessard, Philip	Kenora.	Murray, George, Jr.	Waubaushene.
Lovering, William James.	Coldwater.	Maughan, Joseph	Fort William.
Lane, Maurice	Bobcaygeon.	Margach, Wm. J.	Port Arthur.
Lenton, George	Peterborough.	Murray, George, Sr.	Waubaushene.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Manice, Wm.	Peterborough.	Mangan, John.	Arnprior.
Murray, Wm.	Kenora.	Mooney, Thomas.	Kingston.
Morgan, Richard J.	Kenora.	Mason, Robt. T.	Rochesterville.
Magee, Thomas Arthur.	Kenora.	Moore, Wm. John.	Gravenhurst.
Murdoch, James.	Cook's Mills.	Morrison, Donald.	Reay.
Mulvahill, Wm.	Arnprior.	Moore, Wm.	Bobcaygeon.
Murphy, Arthur.	Ottawa.	Mutchenbacker, Herman.	Rosseau Falls.
Mayhew, Jacob.	Northcote.	Moore, Norman.	Arnprior.
Molyneaux, George	Parry Sound.	Morley, John R.	Kenora.
Milway, Joseph.	Fort William.	Mackay, J. A.	Big Forks.
Mackie, Nathan.	Port Arthur.	Miller, Robt.	Montreal.
Milne, Archie.	Arnprior.	Mackey, Levi Ralph.	Keewatin.
Murray, James.	Peterborough.	Morley, Frank W.	Kenora.
Moore, James A. E.	Lakefield.	Madden, F. M.	Haileybury.
Merkley, William A.	Ottawa.	Miller, Walter E.	Owen Sound.
Murphy, Hugh R.	Ottawa East.	Murray, Robt.	Berriedale.
Murphy, W. J.	Arnprior.		
Murray, William.	Markstay.	McCaw, Joseph E.	Tweed.
McFarlane, Robert L.	Warren.	McLaren, Peter.	Kenora.
Martin, Edgerton.	Markstay.	McGregor, Colin F.	Kenora.
Mathieson, Archie.	Fort Frances.	McKenzie, Robert.	Kenora.
Moore, Henry R.	Lakefield.	McFadyen, A. J.	Bracebridge.
Mickle, Chas S.	Gravenhurst.	McCaulay, Thos. J.	Goulais Bay.
Mullen, James.	Webbwood.	McDonald, John C.	Spanish Mills.
Morley, A. W.	Winnipeg.	McKenzie, Alex E.	Ansonia.
Macdonald, James M.	North Bay.	McIntyre, John.	Arnprior.
Money, Harry.	Haileybury.	McDermott, Thos.	Orillia.
Mather, Allen.	Keewatin.	McDermott, Jas. E.	North Bay.
Menzies, Alexander.	Sault Ste. Marie.	McCrindle, Jas.	Sudbury.
Munro, Peter P.	Commanda.	McGhie, Chas. S.	Whitestone.
Mason, Benjamin.	Westmeath.	McGenigal, John H.	Whitby.
Monaghan, John B.	Arnprior.	McCart, Patrick.	Arnprior.
Monaghan, M. J.	Arnprior.	McGrath, Thos. B.	Peterborough.
Mulvihill, John.	Arnprior.	McCormick, James J.	Trenton.
Moran, Andrew.	Rockingham, Qu.	McCarthy, Wm.	Fenelon Falls.
Mulvihill, Michael.	Arnprior.	McAvoy, Owen.	Campbellford.
Mann, John.	Manitowaning.	McConnell, Lewis.	Fesserton.
Marrigan, Richard.	Deseronto.	McMullen, George.	Spragge.
Monaghan, John Dorland.	Deseronto.	McNab, Angus.	Burnstown.
Matheson, Wm.	Chelmsford.	McColgan, C. H.	Quyon, Que.
Munro, Alex. G.	Braeside.	McCallum, Webster.	Arnprior.
Murphy, Oliver A.	Marksville.	McCagherty, Robert E.	Westmeath.
Mellor, Charles.	Port Arthur.	McNab, Archie.	Calabogie.
Millions, Harry.	Gillies' Depot.	McDonald, Malcolm.	Spragge.
MacDonell, R. D.	Biscotasing.	McIvor, J. A.	Fort Frances.
Milne, Fred.	Trout Mills.	McCulloch, M.	Kenora.
Milne, William H., Jr.	North Bay.	McDonagh, Rod.	Callender.
Murphy, Dennis.	Thessalon.	McManus, James.	Arnprior.
Mackie, Thomas.	North Lake.	McKinley, J. H.	Curran.
Miller, P. H.	Blind River.	McPherson, Jas. S.	Rama.
Munro, Philip.	Braeside.	McKinley, Edward C.	Toronto.
Mangan, Patrick.	Arnprior.	McClelland, John.	Parry Sound.
Marcil, Peter.	Ottawa.	McFarlane, J. W.	Cache Bay.
Main, Samuel.	Spanish Station.	McDonald, Roderick.	Pembroke.
Morley, Charles.	Huntsville.	McCormack, Wm.	Pembroke.
Moore, David Henry.	Peterborough.	McCreary, William.	Arnprior..
Murphy, John.	Arnprior.	McCuaig, James C.	Bryson.
Mathieson Daniel.	Chelmsford.	McColman, Peter.	North Bay.
Milne, Wm.,	Ethel.	McLeod, James D.	Gravenhurst.
Mangan, Charles.	Burk's Falls.	McCrimmon, N. K.	Blind River.
Mooney, Lincoln.	Orillia.	McCreary, James, Jr.	Arnprior..
		McPhee, Hugh.	Byng Inlet.
		McCudden, James.	Arnprior..

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
McLachlin, J. A.	Arnprior.	McNally, J. A.	Desbarats.
Macpherson, John	Ottawa.	McNab, Alexander	Arnprior.
McEachren, John A.	Gravenhurst W.	McFarlane, Alexander	Renfrew.
McLeod, Dugald	Gravenhurst.	McFarlane, J. D.	Stewartsville.
McClelland, R. H.	Parry Sound.	McFarlane, Duncan	Renfrew.
McEvoy, Frank	Campbellford.	McKendry, Wm. B.	Arnprior.
McDermottt Peter	Orillia.	McPhee Hugh	Renfrew.
McIlroy, John	Madoc.	McPhee, John	Arnprior.
McNab, Robert J.	Parry Sound.	McLachlin, Peter	Arnprior.
McFadden, James	Ottawa.	McLachlin, Alexander	Arnprior.
McIntosh, James G.	Carleton Place.	Mackey, Edward	Arnprior.
McInnis, Hector D.	Bracebridge.	McEwan, Henry	Trenton.
McKinnon, Malcolm	Bracebridge.	McDonald, Alfred	Peterborough.
McLean, Daniel	Bracebridge.	McGeary, John J.	Sundridge.
McKinnon, Archie J.	Bracebridge.	McDonald, Archibald W.	Gilmour.
McKay, D. C.	Baysville.	McGaw, John Gillen	Queensborough.
McDonald, James	Parry Sound.	McCauley, Barney	Trenton.
McPherson, Allan	Longford.	McDougall, James T.	Klock's Mills.
McDonald, James P.	French River.	McInenly, Thomas	Quebec, Que.
McFarlane, Jos. C.	Port Severn.	McBride, Archibald	Arnprior.
McNabb, Alexander	Thessalon.	McFarlane, Robert L.	Arnprior.
McGillivray, Archibald	Port Arthur.	McGowan, Wm.	Parry Sound.
McGrane, Edward	Lindsay.	McLachlin, Norman	Arnprior.
McLeod, Donald, Jr.	Keewatin.	McDonald, Laughlin	Pendleton.
McDonald, Hector R.	Thessalon.	McIvor, William J.	Collins' Inlet.
McDougall, Duncan	Bracebridge.	McKee, John P.	Sturgeon Falls.
McNabb, Alexander D.	Warren.	McGowan, Thomas	Parry Sound.
McCormack, John C.	Sudbury.	McDermot, Patrick	South River.
McNamara, John	Byng Inlet.	McKay, Angus	South River.
McGillivray, Duncan D.	Algoma Mills.	McDonald, A. J.	Longford.
McIntyre, Daniel A.	Klock's Mills.	McInnis, Angus D.	Gravenhurst.
McNamara, Lewis	Klock's Mills.	McKendry, Alexander	Waubaushene.
McDonald, Sydney C.	Mattawa.	McGuire, Timothy	North Bay.
McGurn, John J.	Buckingham, Qu.	McGrath, John	Peterborough.
McKeown, Jno. Joseph.	Port Arthur.	McWilliams, Jno. Bannon.	Peterborough.
McNeel, David	Sault Ste. Marie.	McCagherty, Patrick	Westmeath.
McEwan, Andrew	Thessalon.	McKendry, Daniel	Arnprior.
McCool, Christopher L.	Cartier.	MacDonald, D. F.	Parry Sound.
McCollom, Donald	Arnprior.	McManus, Thomas J.	Renfrew.
McDowell, Wm.	Cache Bay.	Macfarlane, David R.	Ottawa.
McConnachie, Roy Stewart	Huntsville.	McColgan. Edward	Quyon, Que.
McDonnell, J. K.	Rat Portage.	McKay, John	Emo.
McDonald, Alex. J.	Vermilion Bay.	McKinnon, William	Kenora.
McKay, D. A.	Rainy River.	McKittrick, Frank R. F.	Kenora.
McMillan, James	Kenora.	McMichael, Charles	North Seguin.
McPhee, Ronald	Bracebridge.	McIlroy, Thomas Davis	Madoc.
McKay, George Donner	Dorset.	McDonald. Wm. Henry	Trenton.
McWilliams, Maxwell Theodore	Peterborough.	McGaw, Wm. Thomas	Callender.
McLeod, John	Keewatin.	McMillan, L.	Callender.
McPherson, George	Keewatin.	McDermott, John L.	Orillia.
McDougall, John D.	Kenora.	McDonald, Chas. M.	Pembroke.
McGregor. Duncan	Burnstown.	McPhee, Benjamin	Pembroke.
McLean, Peter W.	Sand Point.	McGee, John Edward	Parry Sound.
McNichol, John	Sudbury.	Macfarlane, Mack	Arnprior.
McInnis, D. E.	Cache Bay.	MacCallum, Alexander	Braeside.
McLaughlin, Samuel	Waubaushene.	McRae, Farquhar	Kenora.
McCollam, John	North Bay.	MacCallum, Albert	Arnprior.
McManus, John C.	Arnprior.	McGonigal, John	Arnprior.
McLean, John	Blind River.	McConachie, John	Huntsville.
McLeod, Norman	Garden River.	McKay, D. G.	Kenora.
McLean, James	Blind River.	McDonald, James	Peterborough.
		McCulloch, John L.	Lonsdale.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
McConnell, James	Mine Centre.	O'Neill, Mark	Renfrew.
McIntyre, William John	Fort Arthur.	Orrill, John	Trenton.
McDonald, Allen	Big Forks.	O'Neill, Patrick	Bancroft.
McLay, Albert	Devlin.	Orde, Francis W	Kenora.
McQuarrie, Daniel	Fort Frances.	O'Driscoll, Joseph	Sault Ste. Marie.
McNaughton, Daniel	Bracebridge.	O'Gorman, Peter	Blind River.
McCagherty, William E	Westmeath.		
McDonald, John D	Mattawa.	Pigott, John	Fitzroy Harbour.
McCagherty, Joseph T	Westmeath.	Paul, Charles A	Sault Ste. Marie.
McAdam, Arch H	Quyon, Que.	Patinson, Thos	Bracebridge.
McMurphy, Dugald, Jr	Kenora.	Price, A. E	Arnprior.
McCall, Alfred	Kenora.	Presley, J. F	Ashton.
McRitchie, William	Kenora.	Power, James	Bobcaygeon.
McRitchie, Malcolm	Kenora.	Patzel, Adolph	Arnprior.
McDonald, John Harold	Rydal Bank.	Plaunt, William B	Eganville.
McAuley, William Davis	Sault Ste. Marie.	Plaunt, Joseph	Eganville.
McCallum, Thomas	Fort William.	Porter, Charles C	Longford.
McWhinney, Fred	Kenora.	Preston, R. E	Kenora.
McNairney, Hugh H	Sudbury.	Petrie, Geo. A	Fergus.
McKelvie, William	Otter Lake Sta.	Pomeroy, Peter	Trenton.
McGovern, Frank	Sault Ste. Marie.	Perry, Pringle K	Byng Inlet, N'th.
McCallum, Gordon	Fort Frances.	Purcall, W. G	Ottawa.
McCallum, Henry	Fort Frances.	Purvis, John	Parry Sound.
McLaughlin, Russell	Spanish Mills.	Porter, James	Uphill.
McAdam, Miner S	Quio, Que.	Pearson, John James	Lindsay.
McDougall, David A	Nesterville.	Penney, Chas G	Cache Bay.
McLeod, William A	Manitowaning.	Pennock, James P	Hardwood Lake.
McKee, D. A	Wylie.	Purdy, John A	Uxbridge.
McKay, Norman	Fort Frances.	Playfair, R. J	Blind River.
		Paterson John	Wahnapitae.
Nescott, George	Kenora.	Paterson, Alexander	Orillia.
Newton, Frank	Gravenhurst.	Parke, James	Gravenhurst.
Newburn, Wm	Parry Sound.	Parquette, Oliver	Webbwood.
Niblett, James	Arnprior.	Palmateer, Sherman	Gravenhurst.
Niblett, Robert	Osceola.	Paget, George	Huntsville.
Nevison, Herbert	Kenora.	Pounder, Joseph	Westmeath.
Nicholson, John	Owen Sound.	Pell, Richard D	Arnprior.
Newall, John H	Parry Harbour.	Perry, Frederick	Port Arthur.
Nolan, John	Gravenhurst.	Paget, Charles Edward	Novar.
Newton, Charles W	Victoria Harbour.	Porter, Thos. Robt. Mark	Dorset.
Nent, Charles	Vermilion Bay.	Pountney, E. J	Arnprior.
Needham, John G	Pakenham.	Pyburn, David J	Dorset.
Netterfield, David	John's Island	Purdy, Geo	Hintonburg.
Nault, James	Fort Frances.	Playfair, Andrew Wm	Sault Ste Marie.
		Pipe, Taylor	Haileybury.
Oullette, Joseph P	Cutler.	Pipher, George E	Mowat.
O'Neil, Thomas	Bancroft.	Pendee, David	Parry Sound.
O'Neill, Daniel H. H	Arnprior.	Piper, A. J	Blind River.
O'Leary, Patrick J	Orillia.	Paget, Alfred H	Ahmic Harbour.
Oliver, Charles R	Fesserton.	Powers, John J	Trout Mills.
Overend, George J	Longford Mills.	Pigott, William D	Fitzroy Harbour.
O'Brien, Andrew	Ottawa.	Potts, Cyril	North Lake.
O'Brien, Frank G	Arnprior.	Pilkey, William	La Vallee.
Oliver, J. A	Fort William.		
Owen, W. J	Wabigoon.	Quinn, William	Peterborough.
O'Connor, John	Hintonburg.	Quigley, Hugh	Penetang.
Oliver, Darcy	Wahnapitae.	Quirk, Thomas J	Petawawa.
O'Connor, Wm	Nosbonsing.	Quance, Louis F	Berriedale.
O'Neil, James W	North Bay.		
O'Donnell, Wm	Penetanguishene.	Robertson, D	Kenora.
Owens, Richard	Basin Depot.	Richardson, Fred'k George	Trenton.
O'Reilly, Patrick	Cartier.	Richards, Richard	Tamworth.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Riddell, Geo. Alexander..	Rochesterville.	Ritchie, James A.....	Spragge.
Robertson, Lewis McLean.	Dunchurch.	Ross, George Joseph.....	Schrieber.
Robinson, Wm. F.....	Bobcaygeon.	Rowe, Frank E.....	Hymers.
Reamsbottom, Wm.	Mattawa.	Regmibal, J. Hector	Larchwood.
Richey, Evan.....	Brentwood.	Reid, William T.	Fort Frances.
Randall, Lewis G.....	French River..	Ross, Sidney	Fort William.
Richardson, Chas. Marvyn	Trenton.		
Rochester, Daniel Baillie.	Ottawa.	Smith, M. D.....	Fort William.
Riddell, James.....	Ottawa.	Scanlan, William.....	Enterprise.
Rice, Asa S.....	Hull, Que.	Sutherland, D. H.....	Gravenhurst.
Roberts, T. A.....	Huntsville.	Spanner, John.....	Huntsville.
Ross, Andrew	Longford Mills.	Shier, James D.....	Bracebridge.
Rose, Donald M.....	Kenora.	Spooner, W. R.....	Katrine.
Rawson, Charles Edward.	Coldwater.	Simpson, Alfred E.....	Wakefield.
Ross, George.....	Waubaushene.	Souliere, John B.....	Ottawa.
Roberts, Percy T.....	Keewatin.	Shields, James A.....	Carleton Place.
Ritchie, Wm. D.....	Little Current.	Spargo, George.....	Ottawa.
Ramsay, Robert.....	Arnprior.	Smyth, W. H.....	Baysville.
Ritchie, J. F.....	Arnprior.	Salmon, R. H.....	Byng Inlet North
Ritter, Samuel G.....	Ahmic Harbour.	Salmon, Alexander C.....	Baysville.
Rothera, Charles F.....	Sturgeon Falls.	Stremer, A.....	Ottawa.
Ryan, Alfred.....	Byng Inlet.	Shields, Frank A.....	Parry Sound.
Rogers, Fred.....	Sault Ste. Marie.	Stapleton, John J.....	Ogidakie.
Reid, George William....	Fort Frances.	Sloan, William H.....	Fort Frances.
Robertson, John A.....	Kenora.	Smyth, Job E.....	Cache Bay.
Robinson, Wm.....	Bobcaygeon.	Sage, Nelson.....	Muskoka Mills.
Reid, Joseph B.....	Lindsay.	Seymour, Edward.....	Whitefish.
Ross, Walter M.....	Ottawa.	Shaw, Thomas B.....	Waubaushene.
Ruttle, H. A.....	Carleton Place.	Swanston, James.....	Peterborough.
Richards, Benedict.....	Ottawa.	Simpson, William.....	Hall's Bridge.
Regan, John.....	Orillia.	Sadler, Thomas.....	Lindsay.
Russel, Wm.....	Pembroke.	Smith, Patrick Albert....	Norman.
Ramsay, Charles.....	Sudbury.	Snaith, William J.	Mattawa.
Russell, Corsan L.....	Pembroke.	Sinn, William F.....	Arnprior.
Richards, Henry.....	Dacre.	Sheppard, Wm. Joseph...	Waubaushene.
Ryan, Wm.....	Killaloe.	Spears, Milton B.....	Barry's Bay.
Reid, John P.....	Spanish Mills.	Stevenson, Arthur.....	Peterborough.
Ridley, Robert.....	New Liskeard.	Stein, Paul.....	Sault Ste. Marie.
Riley, Charles W.....	Hutton House.	Shaw, Alfred.....	Thessalon.
Raymond, Morris T.....	Spanish Mills.	Sequin, Napoleon.....	Spanish Station.
Rooney, Wm. H.....	Campbellford.	Scrim, Robert	Arnprior.
Revell, J. O.....	Dryden.	Sharp, James A.....	Sudbury.
Rankin, Anthony	Cache Bay.	Shaneay, Harry S.....	Cook's Mills.
Ross, Angus.....	Orrville.	Smith, Wm.....	Ottawa.
Robinson, Albert E.....	Washago.	Stewart, Daniel.....	Braeside.
Robinson, Edward.....	Washago.	Sheehan, Michael H.....	Waubaushene.
Robinson, Thomas G.	Washago.	Smith, Sydney H.....	Bracebridge.
Raycroft, William T.....	Sarnia.	Stewart, James A.....	Pembroke.
Roberts, Ivor M.....	Garden River.	Sproule, Newton H.....	Schomberg.
Revell, Lionel Oliver.....	W. Gravenhurst.	Simmons, Alex.....	Port Arthur.
Regan, Judd Patrick.....	Orillia.	Scott, Thomas.....	Parry Sound.
Robins, Etna Rosedale....	Orillia.	Smith, Lawrence.....	W. Saginaw, Mich.
Regan, John, Jr.....	Orillia.	Shea, Stewart.....	Campbellford.
Ryan, James	Savanne.	Sullivan, John.....	Sault. Ste. Marie.
Rusk, Oscar W.....	Cache Bay.	Sinclair, Finlay.....	Sudbury.
Robinson, Thos. Geo.....	Bracebridge.	Shiels, Henry F.....	Cartier.
Rooksby, Wm.....	Campbellford.	Smith, Gideon Ousley....	Burk's Falls.
Ramesbottom, Robt.....	Byng Inlet.	Smith, John Wallis.....	Thedford.
Roy, Lewis.....	Arnprior.	Smith, Henry G.....	Arnprior.
Riddell, Horace A.....	Galetta.	Story, John A.....	Ottawa.
Rowan, A. L.....	Sault Ste. Marie.	Sweezy, Benjamin.....	Massey.
		Sheppard, Charles H.	Coldwater.

List of Persons holding Cullers' Licenses.—*Continued.*

Name.	P. O. Address.	Name.	P. O. Address.
Sinclair, Armon D.	Arnprior.	Tucker, Louis A.	Fort Frances.
Smith, Sidney E.	Ottawa.	Thompson, Daniel	P'rt'ge du F'rt, Q.
Sleeman, Wm.	Rapid River.	Thompson, Richard	Kenora.
Sheehan, Peter F.	Loring (canc'l'd).	Thompson, Joseph H.	Bracebridge.
Sleeman, Geo.	Rapid River.	Taylor, Edward A.	Westmeath.
Sims, Wm. K.	Sault Ste. Marie.	Tait, Ralph	Arnprior.
Skahill, Wm.	Blind River.	Train, William	Burk's Falls.
Shaw, George	Thessalon.	Turner, Garvin F.	North Bay.
Sarsfield, George Francis.	Sault. Ste. Marie.	Tilson, Joseph	Burk's Falls.
Standish, Wm. H.	Batchawaning	Tuffy, John	Cartier.
Simpson, Wm. A.	Lakefield. (Bay	Thorpe, Thomas	Pembroke.
Scollard, Wm.	Young's Point.	Taylor, Charles E.	Gravenhurst.
Shuttleworth, Alma	Trout Creek.	Tench, Arthur	Hekkla.
Shanacy, Wm. J.	Spragge.	Tulloch, William A.	Sault Ste. Marie.
Seely, George	Arnprior.	Taylor, Alex. M.	Burnstown.
Stewart, Alex. W.	Lanark.	Toner, J. A.	P'rt'ge du F'rt. Q.
Soreny, Wm.	Braeside.	Thrasher, Henry G.	Pembroke.
Schneder, Frederick	Cache Bay.	Tooke, Frank	Bala.
Smith, James D.	Rat Portage.	Thorburn, Donald James	Thessalon.
Sullivan, James	Aylmer.	Tetreault, Philias	Tomiko.
Scully, Cornelius	Whitney.	Tibbets, L. R.	Fort Frances.
Savoy, Eutrope	North Bay.	Tichborne, A. C.	Fort Frances.
Smith, Walter J.	Campbellford.		
Seymour, John J.	Whitefish.	Udy, Dean	French River.
Smith, Alex. R. C.	Burk's Falls.	Urquhart, Elias	Gravenhurst.
Stewart, Richard M.	Chelsea, Que.	Urquhart, Andrew	Barrie.
Souliere, John H.	Canoe Lake.		
Smith, Abraim G.	Quyon, Que.	Vigrass, Percy J.	Dufferin Bridge.
Swallow, C. H.	Day Mills.	Vincent, Joseph	Warren.
Strave, A. M.	Mine Centre.	Vollin, Samuel	Nosbonsing.
Stewart, John	Fort Frances.	Vannier, Nelson Joseph	Bobcaygeon.
Sullivan, George L.	Rainy River.	Vincent, James	Fesserton.
Short, James	Kenora.	Vincent, Henry T.	Port Sidney.
Shaw, Fred. Jason	Thessalon.	Vanderburg, Norman	Wisawasa.
Short, Chas. J.	Kenora.	Valois, Armand	Mattawa.
Smith, David H.	Sudbury.	Villiers, Claude	Parry Sound.
St. Hillaire, George	Arnprior.	Vanier, John	Sault Ste. Marie.
Souliere, Joseph C.	Cutler.		
Scott, J. C.	Fort Frances.	White, Thomas S.	Bracebridge.
Stewart, Frank E.	Crozier.	White, A. Thomson	Pembroke.
Sanders, Edward	Barwick.	Watt, R. A.	Spanish.
Spence, William	Arnprior.	Wilkins, Hughes	Blind River.
Scott, Allan A.	Norman.	Wallace, T. William	Blind River.
Souliere, Max	Spanish Mills.	White, Joseph W.	Bracebridge.
		Watson, William	Huntsville.
Taylor, Fred. L.	Parry Sound.	Webb, George W.	Parry Sound.
Thomas, Griff J.	Thessalon.	Wilcox, Thomas	Parry Sound.
Thomson, R. D.	Biscotasing.	Wheeler, J. A. McL.	Tamworth.
Tait, Thomas B.	Burk's Falls.	Widdifield, C. H.	Pine Orchard.
Taylor, C. M.	Gravenhurst.	Whitmore, Edgar	Rosseau Falls.
Thornton, W. D.	Longford Mills.	Wright, L. B.	Sault Ste. Marie.
Trussler, Gilbert	Trout Creek.	Ward, Joseph W.	Ottawa.
Thompson, Geo. S.	Lindsay.	Wilkinson, W.	French River.
Thompson, Fred. A. H.	Nosbonsing.	Waldie, John E.	Victoria Harbour.
Thompson, Francis Hy.	Nosbonsing.	Wigg, Thomas G.	Thessalon.
Train, A. C.	Rowan Mills.	Wall, Patrick B.	Cheboygan, Mich.
Turgeon, Geo.	Cook's Mills.	Wells, John R.	Little Current.
Thayer, Wm.	Sault Ste. Marie.	Whiteside, John	Huntsville.
Thompson, Alexander W.	Arnprior.	Watt, William	Peterborough.
Taylor, Thos. G.	Gravenhurst.	Wilson, George	Lindsay.
Trowse, A.	Arnprior.	White, Thomas	Parry Sound.

List of Persons holding Cullers' Licenses.—*Concluded.*

Name.	P. O. Address.	Name.	P. O. Address.
Wood, William D.	Sault Ste. Marie.	White, Allan	Pembroke.
Watts, John J.	Fort Frances.	Warner, Franklin H.	Fort Frances.
Webster, George F.	Fort Frances.	Watts, George	Fort Frances.
Wright, Percy	Fort Frances.	Wood, Thomas	Parry Sound.
Watts, William B.	Fort Frances.	White, William	Peterborough.
Watson, William	North Bay.	Woods, A. L.	Kenora.
Wagner, Fred	Kenora.	White, John B.	Kippewa, Que.
Wainwright, Edward C.	Huntsville.	Whelan, Peter M.	Renfrew.
Wilson, Wm. James	Deseronto.	Wilson, David	Kearney.
Weston, Frank R.	Midland.	Weston, Cecil	Dorset.
White, James B.	Manitowaning.	Wilkins, George E.	Dorset
Warren, Robert M.	Cache Bay.	Woodcock, Edward	Brownhill.
Wilson, George A.	Balsam Hill.	Wilson, Fred.	Callender.
Welch, Harold	Milberta.	Wilson, Alexander R.	Thessalon.
Wilson, James A., Jr.	Webbwood.	Webster, Henry R.	North Lake.
Woods, John R.	Antrim.	Wallace, Fred. R.	Port Arthur.
Wardell, Ernest C. S.	Victoria Harbour.		
Woods, Joseph F.	Roach's Point.		
Whaley, Thomas	Huntsville.	Younge, Harvey D.	Fort Frances.
Webster, Wm. Alfred	Bracebridge.	Young, R. H.	Fort Frances.
Wornsdorf, Fred. Gutlep	Pembroke.	Yuill, John Albert	Braeside.
Warrell, Wm.	Trout Creek.	Young, William	Severn Bridge.
Wims, Peter	Blessington.	Young, A. J.	Cache Bay.
Wickware, Philip Almont.	Cloyne.	Young, Samuel	Coldwater.
Wilson, Edward	Deseronto.	Young, Patrick P.	Young's Point.
Whelan, P. J.	McDougall.	Young, Francis G.	Young's Point.
Whyte, John Thos. Goth.	Ottawa.	Yuill, Thomas	Arnprior.
Watterworth, J. A.	Sault Ste. Marie.	Yuill, A. D.	Braeside.
White, Wm. James	Muskoka Falls.	Young, C. T.	Harvey.
Warrell, George	Powassan.	Yuill, John Alex.	Arnprior.
Wells, George W.	Little Current.	Yuill, Archibald	Bracebridge.
Wilson, Frederick Gould.	Kenora.	Yuill, William	Braeside.
Wallace, John Thomas	Thessalon.	Young, Walter D.	Whitefish.
Wilkins, George N.	Baysville.		
Wylie, Byron M.	Webbwood.	Total, 1,400.	

AUBREY WHITE,
Deputy Minister.

NINETEENTH ANNUAL REPORT

OF THE

BUREAU OF MINES, 1910

VOL. XIX., PART I.

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1910

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MAPS

(1) Lake Savant Iron Range Area, northwest of Lake Nipigon, District of Thunder Bay, by E. S. Moore (geologically colored). Scale: 2 miles to an inch.

(2) Part of the North Shore of Lake Superior, District of Thunder Bay, by H. L. Kerr (geologically colored). Scale: 1 mile to an inch.

(3) Porcupine Gold Area, Districts of Sudbury and Nipissing, by A. G. Burrows and W. R. Rogers (geologically colored). Scale: 1 mile to an inch. Detail maps by A. G. Burrows and C. W. Knight. Scale: 400 feet to an inch.

(4) Profile from Toronto to the Archean-Paleozoic boundary on Hudson Bay slope. Scales: Horizontal, 20 miles to an inch; vertical, 400 feet to an inch.

LETTER OF TRANSMISSION

To His Honour John Morison Gibson, Etc., Etc., Etc.,

Lieutenant-Governor of the Province of Ontario:

Sir,—I have the honour to transmit herewith for presentation to the Legislative Assembly of the Province of Ontario, the Nineteenth Annual Report of the Bureau of Mines.

I have the honour to be, Sir,
Your obedient servant,

F. Cochrane,
Minister of Lands, Forests and Mines.

Department of Lands, Forests and Mines,
Toronto, 10th March, 1910.

INTRODUCTORY LETTER

To The Honourable Frank Cochrane,
Minister of Lands, Forests and Mines:

Sir,—I beg to hand you herewith to be presented to His Honour the Lieutenant-Governor In Council, the Nineteenth Annual Report of the Bureau of Mines.

The Report is in two Parts.

Part I. contains a Statistical Review of the mining industry of Ontario for the year 1909, including tables showing the quantity and value of the output of the various minerals and mineral substances which are the products of that industry. The growth and progress of the several branches of mining and metallurgy during the year are briefly described, and particulars given as to the developments which are taking place. Generally speaking, it may be said that the record of 1909 is the best yet. The aggregate value of the production is much greater than that of any previous year, and this is in face of the fact that prices for some of the most important products have remained stationary, or have even declined. The results so far obtained from the exploitation of Ontario's mineral resources warrant us in believing that in no part of Canada is there greater metalliferous wealth than is contained in the Pre-Cambrian rocks of the northern and eastern parts of this Province. In silver, Ontario's production is third in quantity among the silver-producing communities, being surpassed only by Mexico and the United States. Her nickel mines now supply most of the nickel used throughout the world. In some products of minor yet of considerable importance Ontario takes high rank. Among these are: Cobalt, arsenic, corundum and mica, sharing with Quebec her position with regard to the last-named. Other departments of the mineral industry continue to grow in output; natural gas, iron pyrites, feldspar, Portland cement. There is no reason apparent why Ontario should not continue to make good her claim to the premier place in the mining industry among the confederated Provinces of Canada.

Details regarding the revenue derived from mining sources are given in Part I. There is also presented a paper on Mining Accidents, in which Mr. E. T. Corkill, Inspector of Mines, analyzes the casualties occurring in the mines of Ontario with reference to their causes and the steps which may be taken looking to the reduction of their number, which compares unfavorably with many other countries.

Mr. Corkill reports as well upon the operating mines of Ontario, giving details of work done during the year; also upon water powers made use of for working mines. This source of energy is abundant in the mining districts and is exercising a very favorable influence upon their development.

A brief paper by Mr. G. R. Mickle, Mine Assessor, on the Kent Gas Field, shows the importance of natural gas to the people of a portion of the southwestern peninsula of Ontario, and the part this cheap and efficient fuel plays in the domestic and industrial life of the community.

The basic importance of the iron industry and the certainty that the diminution now going on in the known supplies of first-class iron ore on this continent must sooner or later bring into use deposits of ore now regarded as of little value because of the impurities which they contain, has led the Bureau to investigate the question of how far the low grade magnetites of Ontario are amenable to improvement by known processes of concentration. Experiments were carried on by Mr. George C. MacKenzie on ores from typical Ontario deposits, varying in chemical composition and physical structure, and the results obtained are described by Mr. MacKenzie in his paper on Concentration of Low Grade Magnetites.

In the summer of 1909 Dr. E. S. Moore explored the Iron formations of Lake Savant and his report thereon will be found under the title of Lake Savant Iron Range Area.

A paper on the Nepheline Syenites of Port Coldwell, by Mr. H. L. Kerr, describes these interesting rocks, and indicates the possibility of obtaining from the north shore of Lake Superior material equal to certain Norwegian granites, highly esteemed for monumental and structural purposes.

Accompanying Part I. are geologically colored maps of (1) Lake Savant Iron Range Area, (2) Port Coldwell Region, and (3) Porcupine Gold Area, together with an etching showing the profile of that part of Ontario stretching from Toronto to the boundary between the Archean and Paleozoic formations, north of the height of land.

Part II., which will be issued later in the year, will be a revision of Professor W. G. Miller's Report on the Silver Regions of Northern Ontario, including Cobalt, South Lorrain, Montreal River and Gowganda. This will be the fourth edition, and will be accompanied by separate maps of the Cobalt and Gowganda regions. Both will be geologically colored, and on a scale of one mile to the inch.

I have the honour to be, Sir,

Your obedient servant,

THOS. W. GIBSON,
Deputy Minister of Mines.

DEPARTMENT OF LANDS, FORESTS AND MINES,
Toronto, 10th March, 1910.

REPORT OF THE BUREAU OF MINES 1910

VOL. XIX PART I

STATISTICAL REVIEW

By Thos. W. Gibson, Deputy Minister of Mines.

The output of the mines and mineral works of Ontario for the year 1909, according to returns made to the Bureau of Mines under the provisions of the Mining Act of Ontario, had a value of $32,981,375, as shown in the table of production below (Table I.).

As compared with the output of 1908, previously the largest on record, the increase was 28 per cent. The rapidly growing importance of the mineral industry is sufficiently attested by these figures, especially when it is borne in mind that the value of the products is computed on their selling prices at the mines or other places of production. Calculating the metallic products only on the basis of "refined values," namely, the market prices of the refined metals, the valuation of the entire production is upwards of 37 million dollars, or about 41 per cent. of the total output of the Dominion of Canada for the year. (See Table III.)

Formerly, the non-metallic products surpassed those of a metallic kind in value of production. In 1905, for the first time, the metalliferous substances took the lead, and each year since then the difference has increased, until in 1909 the proportion of the whole furnished by the metals was 70 per cent. Both classes of products show substantial gains, the value of the metals as compared with 1908 having increased 37 per cent., and of the non-metals 13 per cent.

Silver is the chief item of increase, the value being $3,327,892, or 36 per cent.; next comes pig iron, increase $1,910,689, or 43 per cent.; then nickel $924,739, or 49 per cent. Iron ore is greater by $70,783, copper by $55,875, and zinc ore by $8,950. Gold is less by $27,892, and cobalt by $16,153. Of the non-metallic products, Portland cement shows an increase of $479,579, or 20 per cent., and natural gas $199,563, or 20 per cent. Bricks of all kinds are greater in value by $357,170, or 17 per cent., drain tile by $24,892, and lime by $22,262. On the other hand, petroleum shows a decrease of $144,295, or 26 per cent., salt of $98,757, stone of $70,311, and sewer pipe of $32,430. Further comment upon these and other fluctuations in production will be made when dealing with the several products in detail.

Of the aggregate production the larger items contributed the following percentages: Silver 38, pig iron 19, nickel 8, copper 3.4, Portland cement 8.8, bricks 7.5, natural gas 3.6, petroleum 1.7. These products account for about 90 per cent. of the total production, the remaining 10 per cent. being contributed by 22 other articles of smaller output.

In Table I. is given a summary of the mineral production for 1909, together with the number of employees engaged in the mines or works by which the various articles were produced, and the amounts paid them as wages. It should, perhaps, be stated, in order to prevent misunderstanding, that these statistics deal with producing mines and plants only, and take little or no account either as regards employees or wages of those

prospects, mines or works which have not yet reached the stage of actual production. There are many properties upon which more or less work has been done, but which cannot properly be classed as mines or related in any way to a table of mineral production. Among these, for instance, is the large number of unpatented mining claims upon which, in order to comply with the provisions of the Mining Act, 30 to 90 days' work is done within the year. To class the prospectors or laborers who do this work as working miners or employees engaged in producing minerals, would be misleading. There are also those openings, further advanced than mere prospects, yet not entitled to be designated mines, whose owners carry on work in them from time to time as they happen to be in funds for doing so, perhaps for a few weeks or months in one year, and then not at all perhaps for several years. Not many properties in this Province give regular employment to any considerable amount of labor which are not at the same time producing mineral. In almost every branch of the mining industry the period necessarily elapsing between the beginning of serious work and the proving of the property is comparatively short. If the attempt to make a mine succeeds, the raising of ore begins; if it fails, work ceases either permanently or for the time being. For these reasons, therefore, only the labor engaged in winning minerals or turning out mineral products, as the case may be, or in operating mines properly so called, is comprehended in the table of production annually given in the Bureau's reports.

Table I.—Mineral Production of Ontario, 1909

Product.	Quantity.	Value.	Employees.	Wages.
Metallic:		$		$
Gold.....ounces	2,042	32,445	100	68,206
Silver..... "	25,903,985	12,464,722	3,251	2,605,128
Cobalt.....tons	1,533	94,965		
Nickel..... "	13,907	2,790,798	1,796	1,276,091
Copper..... "	7,933	1,127,015		
Iron ore..... "	263,777	645,622	391	230,446
Pig iron..... "	407,013	6,301,528	2,231(a)	1,379,308(a)
Zinc ore..... "	895	8,950	20	7,700
	.....	23,466,045	7,779	5,566,879
Less value Ontario iron ore (220,307 tons) smelted into pig iron.....	.....	537,549	.....	.....
Net metallic production.....	.....	22,928,496	7,779	5,566,879
Non-metallic:				
Arsenic, refined.....tons	1,085	61,039	(b)	(b)
" crude..... "	3,218	.....	.....	.....
Brick, common.....No.	246,308,000	1,916,147	3,166	961,881
Tile, drain..... "	27,418,000	363,550		
Brick, pressed..... "	53,166,941	490,571	488	254,950
" paving..... "	4,067,620	73,700		
Building and crushed stone.....	.....	660,000	944	357,821
Calcium carbide.....tons	2,349	151,676	60	39,580
Cement, Portland..... "	2,303,263	2,897,348	1,354	631,137
Corundum, grain..... "	1,508	140,817	165	96,168
Feldspar..... "	11,001	36,204	53	14,858
Graphite, refined..... "	730	37,624	117	34,193
Gypsum, crude..... "	11,488	23,604	41	3,500
Iron pyrites..... "	28,946	78,170	132	104,637
Lime.....bush.	2,633,500	470,858	438	173,905
Mica.....tons	350	73,124	123	38,632
Natural gas.....	.....	1,188,179	171	103,672
Peat fuel.....tons	60	240	7	1,200
Petroleum.....Imp. gal.	14,723,105	559,478(c)	436(d)	261,014
Phosphate of lime.....tons	272	1,904	12	4,371
Pottery.....	.....	43,214	33	12,837
Quartz.....tons	63,172	75,329	111	46,906
Salt..... "	77,490	389,573	176	89,995
Sewer pipe.....	.....	311,830	200	96,815
Talc.....tons	4,350	8,700	12	3,316
	.....	10,052,879	8,239	3,331,388
Add metallic production.....	.....	22,928,496	7,779	5,566,879
Total production.....	.....	32,981,375	16,018	8,898,267
Total for 1908.....	.....	25,637,617	15,189	7,858,267

(a) Includes steel making. (b) Included in cobalt and silver. (c) Value crude, exclusive of Dominion government bounty. (d) Petroleum refineries only.

In the following table the changes in production for 1909 are shown, as compared with 1908:—

Table II.——Comparative Value Mineral Production, 1908 and 1909

Product.	1908.	1909.	Change. (I) Increase. (D) Decrease.	
Metallic:	$	$		$
Gold	60,337	32,445	D	27,892
Silver	9,136,830	12,464,722	I	3,327,892
Cobalt	111,118	94,965	D	16,153
Nickel	1,866,059	2,790,798	I	924,739
Copper	1,071,140	1,127,015	I	55,875
Iron ore	574,839	645,622	I	70,783
Pig iron	4,390,839	6,301,528	I	1,910,689
Zinc ore		8,950	I	8,950
Non-metallic:				
Arsenic	40,373	61,039	I	20,666
Brick, common	1,575,875	1,916,147	I	340,272
" pressed	485,819	490,571	I	4,752
" paving	61,554	73,700	I	12,146
Building and crushed stone	530,041	459,730	D	70,311
Calcium carbide	147,150	151,676	I	4,526
Cement, Portland	2,417,769	2,897,348	I	479,579
Corundum	11,437	140,817	I	129,380
Feldspar	20,300	36,204	I	15,904
Graphite	1,600	37,624	I	36,024
Gypsum	20,778	23,604	I	2,826
Iron pyrites	69,980	78,170	I	8,190
Lime	448,596	470,858	I	22,262
Mica	73,586	73,124	D	462
Natural gas	988,616	1,188,179	I	199,563
Peat fuel	900	240	D	660
Phosphate of lime	7,048	1,904	D	5,144
Petroleum	703,773	559,478	D	144,295
Pottery	50,310	43,214	D	7,096
Quartz	52,830	75,329	I	22,499
Salt	488,330	389,573	D	98,757
Sewer pipe	344,260	311,830	D	32,430
Talc	3,048	8,700	I	5,652
Tile, drain	338,658	363,550	I	24,892

Owing to the difference between the basis adopted for reporting the value of minerals and mineral products by the Bureau of Mines, and that employed by the Mines Department at Ottawa, and the consequent variation in the results obtained, the schedule of production (Table I.) is herewith presented with values and quantities of the metallic products recast in accordance with the Mines Department's methods. The effect is to permit an intelligent estimate to be made of the importance of Ontario's mineral industry, as compared with that of the remainder of Canada. Of a total production for 1909, reported by the Mines Department for the whole of the Dominion, it will be seen that Ontario contributed $37,352,124, or 41 per cent. In the metalliferous branches of mining, Ontario's pre-eminence is marked. The Mines Department values the total metallic production of Canada in 1909 at $45,188,387. Of this Ontario contributes $27,299,245, or 60 per cent. The merits of the respective methods of computation have been discussed in previous Reports, and need not be dealt with here.

Table III.—Value Mineral Production, 1909, "Mines Department" Basis

Product.	Quantity.	Price.	Value.
			$
Gold oz.	2,042	$15.88 per oz.	32,445
Silver "	25,903,985	51.503 cents per oz.	13,341,329
Cobalt tons	1,533	$61.94 per ton	94,965
Nickel "	13,141 (*a*)	36 cents per lb.	9,461,520
Copper "	7,933	12.982 cents per lb.	2,059,724
Pig iron "	117,389 (*b*)	$15.43 per ton	1,811,312
Zinc ore "	895	$10 per ton	8,950
		Total	27,299,245
Value non-metallic production per Table I.			10,052,879
Gross value production			$37,352,124

(*a*) Contents Sudbury mattes only. (*b*) Proportion pig iron from Ontario ore.

Development of Mineral Industry

The progress of the mineral industry in this Province during the last five years is set forth in the following table. It will be seen that in 1909 the output had a money value nearly twice as great as that of four years ago.

Table IV.—Mineral Production, 1905 to 1909

Product.	1905.	1906.	1907.	1908.	1909.
Metallic:	$	$	$	$	$
Gold	99,885	66,193	66,399	60,337	32,445
Silver	1,372,877	3,689,286	6,157,871	9,136,830	12,464,722
Platinum.. } Palladium. }	28,116	5,652	.....	.....	.....
Cobalt	100,000	80,704	92,751	111,118	94,965
Copper	688,993	960,813	1,045,511	1,071,140	1,127,015
Nickel	3,354,934	3,839,419	2,271,616	1,866,059	2,790,798
Iron ore	227,909	301,032	482,532	574,839	645,622
Pig iron	3,909,527	4,554,247	4,716,857	4,390,839	6,301,528
Steel	3,321,884	(a)	(a)	(a)	(a)
Pig lead	9,000	93,500	.....	.....	.....
Zinc ore	.....	6,000	.....	.....	8,950
	13,113,125	13,596,846	14,833,537	17,211,162	23,466,045
Less value Ontario iron ore smelted into pig iron, and pig iron converted into steel	2,912,115	(b) 243,776	(b) 282,702	(b) 456,176	(b) 537,549
Net metallic production	10,201,010	13,353,080	14,550,835	16,754,986	22,928,496
Non-metallic:					
Actinolite	.....	.....	.....	.....	.....
Arsenic	2,693	15,858	40,104	40,373	61,039
Brick, common	1,937,500	2,157,000	2,109,978	1,575,875	1,916,147
" paving	54,000	45,000	73,270	61,554	73,700
" pressed	234,000	337,795	648,683	485,819	490,571
Building and crushed stone	700,000	660,000	675,000	530,041	660,000
Carbide of calcium	156,755	162,780	173,763	147,150	151,676
Cement, natural rock	10,402	6,000	5,097	.....	.....
" Portland	1,783,451	2,381,014	2,777,478	2,417,769	2,897,348
Corundum	152,464	262,448	242,608	11,437	140,817
Feldspar	29,968	43,849	30,375	20,300	36,204
Graphite	9,825	15,000	20,000	1,600	37,624
Gypsum	4,118	6,605	19,652	20,778	23,604
Iron pyrites	21,885	40,583	51,842	69,980	78,170
Lime	424,700	496,785	418,700	448,596	470,858
Mica	50,446	69,041	82,929	73,586	73,124
Natural gas	316,476	533,446	746,499	988,616	1,188,179
Peat fuel	1,200	900	1,040	900	240
Petroleum (crude)	898,545	761,546	1,049,631	703,773	559,478
Phosphate of lime	.....	.....	.....	7,048	1,904
Pottery	60,000	65,000	54,585	50,310	43,214
Quartz	.....	65,756	124,148	52,830	75,329
Salt	356,783	367,738	432,936	488,330	389,573
Sewer pipe	225,835	279,620	435,088	344,260	311,830
Sodalite	.....	6,000	.....	.....	.....
Talc	2,240	3,030	5,010	2,048	8,700
Tile, drain	220,000	252,500	250,122	338,658	363,550
Total non-metallic production	7,653,286	9,035,303	10,468,538	8,882,631	10,052,879
Add metallic production	10,201,010	13,353,080	14,550,835	16,754,986	22,928,496
Total production	17,854,296	22,388,383	25,019,373	25,637,617	32,981,375

(a) Steel production not included. (b) Iron ore only.

In the table which follows, the entire production of metals in Ontario is given to the end of 1909. Before the establishment of the Bureau of Mines in 1891 there was no provision for the systematic collection of statistics pertaining to the mining industry, and in consequence it is not possible now to do more than estimate the production previous to that year on the basis of such fragmentary information as can at this date be found. The output of every one of the metals since 1891, however, with the possible exception of lead, has been on a much larger scale than before, and any errors in the figures for the pre-Bureau period cannot materially affect the general accuracy of the table. The valuation of the several products, except where otherwise stated, is their selling prices at the places of production and in the form produced.

Table V.—Total Production of Metals in Ontario

Product.	Quantity.	Value.
		$
Gold.....oz.	159,717	2,509,492
Silver (*a*) ..... "	68,221,494	48,069,154
Platinum and Palladium (*b*) ..... "	3,364	62,784
Cobalt (*c*).....tons	4,015	530,771
Nickel (*d*) ..... "	99,384	28,605,868
Copper (*e*) ..... "	89,468	13,000,000
Iron ore (*f*) ..... "	2,950,000	5,525,850
Pig iron (*g*) ..... "	2,208,754	34,500,000
Lead ore (*h*) ..... "	3,351	20,000
Pig lead ..... "	1,143	96,000
Zinc ore ..... "	7,128	86,650

(*a*) For estimated production previous to Cobalt see Bur. Mines, vol. 19, pp. 11, 12.

(*b*) 536 oz. platinum and 952 oz. palladium in 1904. In 1905 and 1906 these metals were reported together. No production has been returned since the latter year. The sole source is the nickel-copper mattes of Sudbury, from which they are recovered during the process of refining.

(*c*) Partly estimated, since the cobalt contents of ore shipments from the Cobalt silver mines are for the greater part not paid for, and no assays are reported to the shippers; 30 3-4 tons were obtained from the Sudbury nickel-copper mattes in 1892-4; remainder is from the ores of the Cobalt mines.

(*d*) From mines of the Cobalt district, partly estimated, as in the case of cobalt, 1,997 tons; remainder from Sudbury mines.

(*e*) From the Sudbury mines 76,042 tons. Practically the only copper produced in Ontario before the opening of the Sudbury deposits was from the Bruce, Wellington and Huron Copper Bay mines on the north shore of Lake Huron. The total output of this group of locations from 1846, when they were opened, down to 1875, the date of their closing, is placed by Mr. H. J. Carnegie Williams, manager of Bruce mines in 1907, at 9,653 tons. (See paper on The Bruce Mines, Ontario, 1846-1906, Journal Canadian Mining Institute, vol. X, 1907.) The value of the production Mr. Williams gives at $3,300,000, as does also the report of the Royal Commission on the Mineral Resources of Ontario, 1890, p. 23. From sources other than Sudbury, mainly deposits on the north shore of Lake Huron, 3,773 tons were obtained since 1900.

(*f*) Statistics of production previous to 1869 are not now obtainable, but have been estimated at 300,000 tons; this, however, is in the nature of a guess, although made after consulting the available data. Previous inquirers have likewise failed to find authoritative figures. Most of the ore raised before 1869 (when the figures for the Provinces are first given separately in the Dominion Government tables) was exported to the United States.

(*g*) Estimated early production 40,000 tons; remainder since 1896.

(*h*) More or less lead ore was raised at various places, such as the Frontenac mine in Loughborough township; Victoria and Cascade mines near Garden River; Enterprise mine in McTavish township, also in Ramsay township, at intervals from 1865 to 1880, but there are no available statistics for this production, and it is not included above. The quantity, however, could not have been great.

Gold

The gold production of 1909 was confined almost entirely to one mine—the well-known Laurentian, in the Manitou Lake region, owned by Imperial Gold Mines, Limited. The amount of bullion recovered, 2,042 ounces, is the smallest reported for any year since 1894. Nothing was being done in the once-busy fields of Lake-of-the-Woods, Seine River, Sturgeon Lake, or Eastern Ontario, and Larder Lake is not turning out any gold.

It is not easy to assign a satisfactory cause for this lack of interest in the gold regions of the Province, but it may be that the attention of prospectors and capitalists alike has for the time being been absorbed by the phenomenal riches of the silver mines of Cobalt and surrounding regions.

Discoveries at Porcupine

The search for silver may, indeed, bring about a revival of gold mining. Prospectors looking for extensions of Cobalt last summer found in the townships of Whitney and Tisdale, near Porcupine Lake, a number of quartz veins of good dimensions, some of which contained considerable free gold on the surface. Mr. John S. Wilson, formerly of Massey Station, Ontario, was one of the earliest discoverers, if not the earliest, and a large outcropping of quartz with spectacular showings of gold has come to be known as "Wilson's dome." It is in places upwards of 100 feet wide. Other smaller veins, also carrying free gold, were located by Miller, Hollinger, Bannerman and others. The news of these finds caused a rush to the neighborhood, and much winter staking of claims took place. Development by shaft sinking has been carried on during the winter months, and if the veins prove to be rich at depth Porcupine gold camp may be the legitimate successor of Cobalt.

The new gold field includes the two townships mentioned and unsurveyed territory to the south, some of which is within the boundaries of the Temagami Forest Reserve. It is reached by winter road from Matheson station on the Temiskaming and Northern Ontario railway, via Night Hawk lake, and also from mile post 222. The summer route is from the latter point by way of Frederick House river and lake, Night Hawk lake, and Porcupine river. For the convenience of prospectors and to permit of mining claims being recorded on the ground instead of at Haileybury or Sudbury, both many miles away, a new Mining Division was established, called Porcupine Mining Division, Mr. Arthur E. D. Bruce, formerly of the Haileybury office, being appointed Recorder, with headquarters at Porcupine townsite, which has been laid out at the eastern extremity of Porcupine lake, on the south half of lot 9 in the fourth concession of Whitney. The date of the Order in Council creating the Division is January 27th, 1910.

Early Explorations of Porcupine Region

In 1896 Mr. E. M. Burwash described the rocks on the east boundary of the township of Shaw, which was at that time mile posts 114 to 120 on the boundary between the districts of Nipissing and Algoma. In Mr. Burwash's report, published in volume 6 of the Reports of the Bureau of Mines, he points out that the district gives promise as a gold field.

The territory in the neighborhood of Porcupine lake and river was explored for the Bureau of Mines by Dr. William A. Parks, of Toronto University, in 1898, who briefly describes the geology of the rock outcrops in the Bureau's Report, 1899 (vol. 8, pp. 175-177). Much of the region was covered by soil and swamp, but the presence of quartz seams in schist was noted. On assay a sample from one of these gave "a minute trace of gold." Again, in 1899, Dr. Parks, reporting on the geology of the tract adjacent to the northerly extension of the line ran in 1898, directs attention to the occurrence of highly silicious schists, both of the hard and softer varieties, the latter being, as he states, more favorable for gold, and hence being particularly mentioned by him in his report. Dr. Parks adds:[1]

> Gold seems to be well distributed over the region; in fact it may be said to occur in nearly all the Huronian belts, but generally in extremely small quantities. The richest specimen was obtained near the Pigeon Rapid on the Mattagami river; and I regard the region south of the trail to Porcupine lake as giving promise of reward to the prospector. The south arm of Matagaming lake and the river above show traces of gold, and a prospect might prove successful in that region.

Perhaps it is no part of a geologist's quest when engaged in determining the geology of an unknown area to search for actual deposits or veins of mineral, nor as a rule has he time or opportunity to do so; but in closely observing and clearly describing the rock formations and such indications of mineral as meet his view, he can sometimes blaze the path for the prospector following in his wake who is sufficiently intelligent to appreciate and make use of the information provided for him. Ten years is not a long time in the history of a Province. Two years ago the Temiskaming and Northern Ontario railway made accessible the region through which it was constructed, and the "promise of reward" south of the Porcupine trail spoken of by Dr. Parks in 1899 was claimed by John S. Wilson in 1909.

Further particulars regarding the townships of Whitney and Tisdale and the Porcupine area generally, including soil, timber, water powers and geology, will be found in the following Reports of the Bureau of Mines: Vol. xiii. (1904), The Abitibi Region, by George F. Kay and Tennyson D. Jarvis, pp. 104-134; and vol. xiv. (1905), Explorations in Abitibi, by James G. McMillan and Archibald Henderson, pp. 184-245; also in vol. xv. (1906), Exploration in Mattagami Valley, by H. L. Kerr and Archibald Henderson, pp. 116-155.

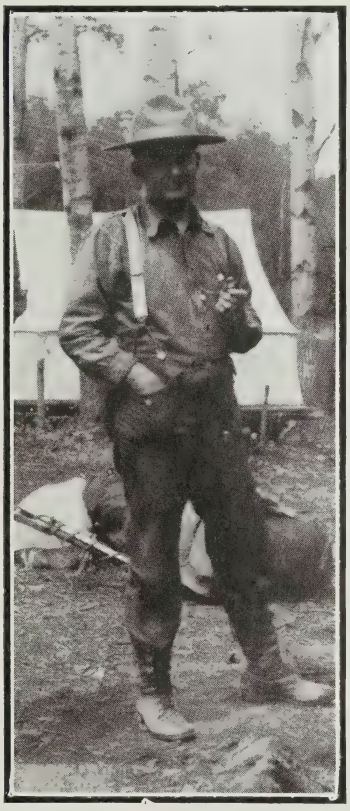
Report by James Bartlett

In October, 1909, Mr. James Bartlett, one of the Bureau's geologists, made a brief examination of the discoveries made up to that time, and reported upon them and on the formations in which they occur. Like previous observers, Mr. Bartlett found very

[1] Rep. Bur. Min., 1900, vol. 9, p. 141.

much of the country drift-covered, comparatively little being rock. His description is as follows:—

Whitney and Tisdale townships are reached from the T. & N.O. Ry., by leaving the train at mileage 228½, which point has been made a flag-station, and named "Red Pine Lakes." The canoe route from here to Porcupine lake, which is situated conveniently to the gold-bearing area, is estimated to be in the neighborhood of sixty miles in length, and is for the most part easy travelling. A fifty-chain portage leads from the railway to a small lake, from the south end of which a crooked creek drains into the Frederick House river. The latter stream is ascended through the lake of the same name to Night Hawk lake, and the remainder of the journey is via Porcupine river to Porcupine lake. Two portages—one of three chains and one of eight chains—occur on the Porcupine.



John S. Wilson, Discoverer of the Dome Mines, Porcupine.

Eight days were spent in this vicinity, and all the reported discoveries of gold were visited.

The area to the north and west of Porcupine lake is a low-lying one, consisting of a level plain, largely swamp-covered, with occasional outcrops of rock. The latter seldom rise to a height of more than ten or twenty feet—as a rule being only four or five feet above the surrounding plain. The rocks of this area strike in a northeasterly direction, and commonly weather with what might be described as a saw-tooth effect caused by the development of two planes of weakness, the one dipping at a high angle to the northwest, and the other at a much lower angle to the southwest. The rocks are much altered and some of the veins occur in a rock which approached a quartz-schist. Besides this type, rocks of a basic and others of a calcareous type occur.

In concessions 1 and 2, especially towards the more southerly part, the country is higher and more rock is exposed, but only a few cases were seen where the hills rise as high as forty feet. In this section the schistosity is much more marked than in the northern area—chlorite and hornblende schists being developed. One outcrop was found of a massive rock, which from the development of serpentine would lead one to suspect that it may have originated from an olivine-bearing rock.

The claims on which gold was seen are as follows:—

N.W. ¼ S. ½ Lot 1, Con. 5, Tisdale—Robert Bruce.

This discovery consists of a series of parallel veins of milky quartz, striking S. 83 degrees E., and varying in width from one to eighteen inches. These had been stripped for about twenty-five feet, and at one point on the contact of one of the veins with the country rock gold is visible in grains and in leaf-like forms.

N.E. ¼ S. ½ Lot 2, Con. 5, Tisdale—W. H. Reamsbottom.

A few specks of gold are to be seen in two irregular bands of quartz from two to three inches wide and dipping to the south at a low angle (almost horizontal).

S.W. ¼ S. ½ Lot 11, Con. 5, Whitney—A. E. Way (known as the "Bannerman" claim).

A vein of quartz on this property has been stripped at intervals for about three chains; strike east and west. Near the western end of the trenching it is about two feet wide, but about one chain to the east it is broken up into five parallel bands from three to twelve inches in width, separated by about six inches of country rock. Dip is not determinable. Gold is visible in two places on this vein.

S.W. ¼ S. ½ Lot 2, Con. 5, Tisdale—W. H. Davidson.

Gold has been found at several points on a vein striking S. 85 degrees E., with a dip to the south. The rock is much disturbed here, and the vein, so far as could be seen with the small amount of stripping, consists of a series of irregular lenses of quartz.

N.W. ¼ N. ½ Lot 4, Con. 1, Tisdale—F. C. Remington (locally known as the "Wilson" property).

The largest body of quartz seen in the district occurs on this property associated with a much decomposed green schist. This vein had been found only a few days before, so that no work had been done on it, but it could be traced for at least six chains in a southwesterly direction, and at one point it appeared to be two chains in width.

Gold could be seen at five or six different spots near the northern end of this outcrop, and one of these showings was the most attractive in the district. Enough gold not in the leaf form, but rather resembling nuggets, was scattered through the quartz in a space of about an inch and a half square to cover a twenty-five cent piece.

The quartz in this vein, as in all the others mentioned above, is of the milky variety and is practically free from sulphides. No sinking has been done on any of these properties and very little trenching. In view of this any estimates of "ore in sight" at the present time are unwarranted.

Since returning from the field another discovery has been reported in the southwestern part of Tisdale township.

It is the intention to have a more careful examination of the region made as soon as the snow leaves the ground in the spring of 1910, and a map dealing with the geology and mineralogy issued as soon as practicable. The map will cover the townships of Tisdale, Whitney, Shaw and Deloro, and will be ready for distribution the latter part of July or early in August. Discoveries of gold have also been made in the townships of Munro and Guibord, west of the T. & N. O. railway, and on one property a shaft 75 feet deep has been sunk.

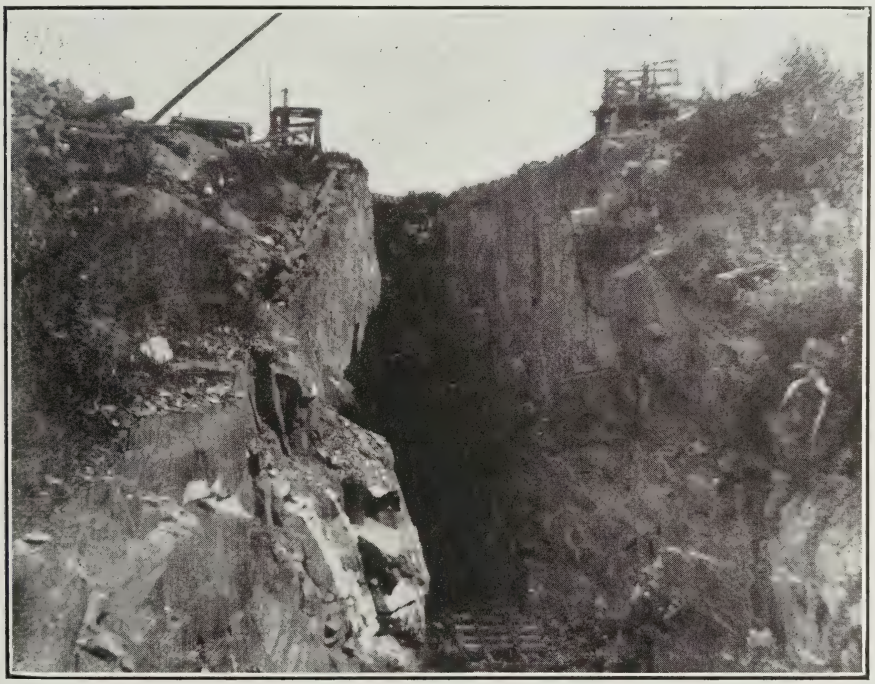
The Mikado gold mine, situated on Shoal lake, west of Lake of the Woods, was in its day a large contributor to the gold output. Opened in 1896 on surface showings of unusual value, operations were continued until 1903, when the mine was closed down as having ceased to be remunerative. Up to the end of March, 1899, 18,464 tons of ore had been milled, yielding 9,575 ounces of gold worth at the mint $137,533.20, or an average of

$7.44 per ton of ore treated.[2] The Mikado has recently passed into the control of Captain H. A. Machin, M.P.P., and associates, who propose during 1910 to re-open and give the property a thorough trial in the belief that it yet contains a good deal of ore.

Sturgeon Lake Gold Field

For ten years or more gold has been known to exist on Sturgeon lake, some 40 miles or more north of Ignace station on the Canadian Pacific railway, and now within a few miles of the line of the Transcontinental railway. Several gold mines have been opened, one of which, the St. Anthony, has been operated with much persistency. Last year Dr. E. S. Moore, after completing the geological survey of the Lake Savant Iron Range area, spent a short time in the Sturgeon lake region. Dr. Moore writes:—

As very little of the field season remained it was found impossible to complete a survey of the area, and it was therefore deemed advisable to visit the region again in 1910, and to postpone a fuller report until the close of next season. The need for additional field work is due largely to the very poor map which exists of Couture lake and the northwestern part of Sturgeon lake, rendering it impracticable to pourtray the area correctly either topographically or geologically.



Open Cut, St. Anthony Mine, Sturgeon Lake.

During the time spent in the field it was found that gold was widely distributed over an area about 12 miles in length by 10 miles in maximum width. The whole gold-bearing area is in proximity to some of the numerous bays of Sturgeon lake. The most important portions lie in the vicinity of Couture lake and around Belmore, East and King's bays. The chief deposit is that of the St. Anthony mines on the shore of Couture lake.

The rocks are largely Keewatin in age, and form a very complex series, consisting of basaltic flows, rhyolites, quartz-porphyries, diorites, gabbros and green schists of indefinite origin. There are also some sediments, as arkoses and greywackés. Intruding this Keewatin series there is the Laurentian granite, which has greatly fractured and

[2] Rep. Bur. Min., vol. 8 (1899), p. 22.

brecciated the Keewatin, and has itself been broken and fissured around the contact. A portion of the granite is porphyritic, to which portion the ore deposits seem to be more or less closely related.

A small area of dolomite was seen, but its age is not certain. Abundant rock exposures make prospecting comparatively easy.

Although the gold-bearing veins seem to bear some relation to the porphyritic granite, it was found also that a number were associated with aplite dikes, which in some cases were near the granite contact, and in others some distance away. The vein matter is almost invariably quartz, generally milky or slightly opalescent, and very often mineralized. The minerals associated with the gold are pyrite, chalcopyrite, zinc blende, galena, pyrolusite and pyrrhotite. Some chromite was found on one of the claims in the vicinity of Belmore bay. On several claims considerable calcite occurs in the small veins and carries free gold. The greater portion of the gold is in the free state, though some of it is not free-milling and occurs with pyrite. The area is noted for the beautiful specimens of free gold which it has produced, and the St. Anthony mine especially has supplied some very fine nuggets.

The veins are generally irregular, as they follow along the contact between the Laurentian and Keewatin, or the cleavage planes of the Keewatin schists. They are in most cases true fissure veins. Their irregularity is due chiefly to the nature of the country rock, and in massive greenstone or quartz-porphyry the veins are usually more clear cut and continuous than in schist.

They have undergone secondary enrichment to some extent, as some of them carry much more free gold near the surface than at depth, and this enrichment seems to be due largely to the action of ferric sulphate.

Silver was reported by several of the prospectors, and an analysis of a promising sample from a claim on North bay of Sturgeon lake made by Mr. N. L. Turner, Provincial Assayer, at Belleville, showed 0.20 oz. gold ($4) and 22.72 oz. silver per ton ($11.36); total $15.36.

A large number of prospectors were at work in the area, and during the summer a considerable amount of development work was done in the shape of shaft-sinking and test-pitting. Although a large number of veins had been located, the majority of them cannot be regarded as of any importance, because of their diminutive size and very irregular form.

It is expected that with the completion of the field work during the coming summer a complete report accompanied by a satisfactory map of the Sturgeon lake gold fields will be published, and it is hoped that these will meet the needs of prospectors in this region.

Silver [3]

The output of silver last year was 25,903,985 ounces, yielding a return to the mining companies of $12,464,722. With the exception of a few thousand ounces produced by one of the mines west of Port Arthur, the entire product came from the mines of the Cobalt region. The advance in yield of these mines year by year has been remarkable, the total output since their opening in 1904 being 63,407,166 ounces. There were 32 producing mines, as follows:—Nipissing, Crown Reserve, La Rose group (including Lawson and University), Kerr Lake, O'Brien, McKinley-Darragh-Savage, Coniagas, Buffalo, Temiskaming and Hudson Bay (now Hudson Bay Limited), Right of Way, Trethewey, Temiskaming, City of Cobalt, Standard Cobalt (Cobalt Central), Chambers-Ferland, Wettlaufer-Lorrain, Beaver Consolidated, Silver Cliff, Nova Scotia, Cobalt Silver Queen, Drummond, King Edward, Cobalt Lake, Bailey, Nancy Helen, Casey Cobalt, Keeley, Foster, White Reserve, Hanson Consolidated. The last named is in the Port Arthur district.

Shipments from the mines comprised 27,742 tons of ore and 2,998 tons of concentrates, a total of 30,740 tons. The ore contained 22,437,595 ounces and the concentrates 3,466,390 ounces of silver, or an average tenor of 809 ounces per ton of ore and 1,165 ounces per ton of concentrates. The total production of concentrates was 3,448 tons from 129,072 tons of low grade ore or rock, the reduction thus being at the rate of 37.4 to 1.

[3] In a letter dated July 29th, 1910, at Heidelberg, Germany, Prof. Wm. Nicol of Kingston announces that he has recognized the mineral "stephanite" ($5\ Ag_2S.\ Sb_2S_3$) in a specimen from Cobalt. This is the first identification of stephanite from the Cobalt deposits.

Concentration of Low Grade Ores

Concentration of low grade material has now become an integral and important feature of mining practice at Cobalt, and is likely to undergo still further development. At the opening of the mines the surface ores were so rich that anything carrying less than 100 ounces per ton was lightly regarded, and was usually consigned to the dump. Now, however, as underground work proceeds, country rock adjoining the veins is frequently found to contain an appreciable proportion of silver, and this along with actual vein matter of low value constitutes the material which is sent to the crusher and concentration tables. At the close of 1909, seven of the mines were operating concentration mills, namely, Buffalo, Colonial, Coniagas, King Edward, McKinley-Darragh-Savage, Standard Cobalt and O'Brien. In addition to these, there were two custom concentrators, the Nipissing Reduction and Northern, at Cobalt, and one, the Montreal Reduction and Smelting Works, at Trout Mills near North Bay. At four other mines, the Nova Scotia, Silver Cliff, Temiskaming and Trethewey, concentration plants were under construction at the close of the year. The mills vary in capacity from 36 tons of ore per day at the King Edward to 150 tons at the Buffalo, with an aggregate of 850 tons, which will be increased to 1,250 tons when the plants now building begin to operate. Wet concentration methods are employed, supplemented at the Buffalo and O'Brien mines by cyanidation. At the Standard Cobalt concentrator a considerable quantity of ore was treated for near-by properties. At several of the mines small lots of metallic silver were smelted into base bullion.

Ore Purchasers and Refiners

Purchases of ore for smelters in the United States were last year as follows: American Smelting and Refining Company, New York; Balbach Smelting and Refining Company, Newark, New Jersey; Pennsylvania Smelting Company Pittsburg, Pa.; United States Metals Refining Company, New York. Ontario smelting companies were: Canadian Copper Company, Copper Cliff, Ont.; Coniagas Reduction Company, Thorold, Ont.; Deloro Mining and Reduction Company, Deloro, Ont. The works at Thorold ran mainly on the output of the Coniagas mine, those at Deloro on ore and concentrates from the O'Brien mine, and also on ores purchased from other mines, while the Canadian Copper Company bought high grade ore from sellers generally. Beer, Sondheimer and Company, of Frankfort-on-Main, Germany, bought some lots of high grade ore for shipment by way of New York, and Quirk, Barton and Company of London, England, obtained a small quantity of cobalt ore. The Canadian companies are the only buyers who pay anything for cobalt; Coniagas Reduction pays 8 cents per pound if cobalt contents are 6 per cent. or over, 10 cents per pound when they amount to 8 per cent. or over, and 12 cents when 10 per cent. or over; Deloro pays 10 cents per pound for 6 per cent. cobalt or over, Canadian Copper Company $10 per ton of ore for 6 per cent. cobalt and upwards, $20 per ton for 8 per cent., and $30 for 12 per cent. and upwards. Nickel and arsenic are not paid for by any buyer. The custom concentrators pay for 55 to 88 per cent. of the silver contents according to the grade of the ore; or will treat ore delivered at the mill at a certain charge per ton, say $4 or $5, and return the concentrates. The total quantity of ore treated by the custom plants was 30,487 tons, yielding 1,195 tons of concentrates.

The three smelting works mentioned as being in Ontario, namely, Copper Cliff, Deloro and Coniagas, are well-equipped refineries, successfully treating the ores of the Cobalt camp for silver. They receive most of the high grade ores produced by the mines, as well as a considerable proportion of the concentrates, the shipments of low grade ores continuing for the most part to go to smelters in the United States, where their silicious contents render them desirable for mixing with more basic material. The quantity of ore sent elsewhere was insignificant, some 137 tons being exported to Germany and England. In all, the Ontario refineries treated last year 8,444 tons of ore and concentrates, and recovered therefrom 12,239,538 fine ounces of silver in addition to a considerable quantity left in the speiss or residues reserved or exported for further treatment.

A theoretically complete treatment of the silver cobalt ores would result in the extraction not only of the silver, but also of the arsenic, cobalt and nickel contents of the ore. Of the first-named, 885 tons in the form of white arsenic were recovered in 1909, but a certain proportion passes into the speiss along with the cobalt and nickel. Cobalt oxide has not as yet been produced on a commercial scale, but small quantities have been obtained in an experimental way. Two of the refining plants, Deloro and Coniagas, are being equipped for the manufacture of cobalt oxide, and will doubtless be in a position to market their product in a short time. It does not yet appear that any profit is to be made in endeavouring to separate the comparatively small proportion of nickel which these ores contain.

There were employed in these reduction works 213 workmen, whose wages for the year amounted to $169,074.

Production and Prices

The total production of silver from the Cobalt mines beginning with 1904, when the first shipments were made, is shown in the following table:—

Table VI.—Silver Production, Cobalt Mines, 1904 to 1909

Year.	Producing Mines.	Shipments.		Silver Contents.		Average Silver Contents per Ton.		Value of Shipments.		Total Value
		Ore,	Concentrates,	Ore,	Concentrates,	Ore,	Concentrates,	Ore,	Concentrates,	
	No.	Tons.	Tons.	oz.	oz.	oz.	oz.	$	$	$
1904	4	158	.....	206,875	.....	1,309	.....	111,887	.....	111,887
1905	16	2,144	.....	2,451,356	.....	1,143	.....	1,360,503	.....	1,360,503
1906	17	5,335	.....	5,401,766	.....	1,013	.....	3,667,551	.....	3,667,551
1907	28	14,788	.....	10,023,311	.....	677	.....	6,155,391	.....	6,155,391
1908	30	24,487	1,137	18,022,480	1,415,395	736	1,244	8,468,293	665,085	9,133,378
1909	31	27,729	2,948	22,436,355	3,461,470	809	1,174	10,809,872	1,651,704	12,461,576
Total..	.....	74,641	4,085	58,542,143	4,876,865	784	1,194	30,573,497	2,316,789	32,890,286

The price of silver remained comparatively steady throughout the year, the lowest figure, 50¼ cents per ounce, being reached on 4th March, and again on 26th and 30th October, and the highest, 53⅜ cents, on 5th May. That the fluctuations were confined to so small a range and the market was so well sustained, is attributed to a steady and continuous demand from buyers in China to redress the balance of trade, there being a substantial increase in the exports of that country, concurrent with stationary or diminishing imports. India has also, as usual, been an important factor in the price of silver, her purchases, though smaller than in 1908, yet being large, amounting to about $33,750,000. To China the shipments of silver from London were about $10,000,000, as against about $4,600,000 in 1908, and from San Francisco about $7,500,000. Prospects for good crops in India and improved trade conditions in China lead to the belief that the demand from these countries will be maintained during 1910, while the requirements of Europe and America for coinage purposes and use in the arts seem likely, on account of the general tendency towards revival in trade, to call for a greater quantity of silver.

Workmen and Wages

In the producing silver mines of the Cobalt camp, including South Lorrain, 2,998 men were employed last year, receiving wages to the amount of $2,446,354. As already stated, the silver refineries employed 213 men, and paid out wages to the extent of $169,074. The custom concentrators required the services of 74 men, to whom they paid as wages $67,592. From non-producing mines in the Cobalt, Elk Lake and Gowganda districts returns have been received showing an aggregate employment of 477 men and of wages paid $271,222. There are numerous properties employing less labor singly and in a more spasmodic way, and also as yet in the non-producing stage, from

which no returns have been received. In the aggregate these properties employ a considerable number of men, and pay out a good deal of money for wages. In order to show the importance of the silver fields in the employment of labor, these several branches of the industry may be enumerated as follows:—

	Employees.	Wages.
Producing Silver Mines	2,998	$2,446,354
Silver Refineries	213	169,074
Custom Concentration Works	74	67,592
Non-producing Properties Reporting	477	271,222
" " Not Reporting (estimated)	1,000	500,000
Total	4,762	$3,454,242

Table VII., which follows, gives the total production of silver, cobalt, nickel and arsenic from the Cobalt mines from the beginning down to the end of 1909.

Table VII.—Total Production, Cobalt Mines, 1904 to 1909

Year.	Shipments, ore and concentrates.	Nickel.		Cobalt.		Arsenic.		Silver.		Total Value.
	Tons.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Ounces.	Value.	
			$		$		$		$	$
1904	158	14	3,467	16	19,960	72	903	206,875	111,887	136,217
1905	2,144	75	10,000	118	100,000	549	2,693	2,451,356	1,360,503	1,473,196
1906	5,335	160	.....	321	80,704	1,440	15,858	5,401,766	3,667,551	3,764,113
1907	14,788	370	1,174	739	104,426	2,958	40,104	10,023,311	6,155,391	6,301,095
1908	25,624	612	.....	1,224	111,118	3,672	40,373	19,437,875	9,133,378	9,284,869
1909	30,677	766	.....	1,533	94,965	4,294	61,039	25,897,825	12,461,576	12,617,580
Total	78,726	1,997	14,641	3,951	511,173	12,895	160,070	63,401,006	32,881,865	33,577,070

The following table of dividend-paying Cobalt companies (page 18) shows that up to the close of 1909 there was returned in dividends to the shareholders the sum of $14,526,068.32, exclusive of profits of mines privately owned, or owned by close corporations. Owing to the fact that in a number of cases the original capitalization was subsequently increased, the proportion of actual investment in these mines which has now been repaid cannot be computed, but taken in conjunction with Table VII., the figures demonstrate that more than one-half the gross proceeds of sales of ore have been paid out as dividends.

Details of Four Leading Mines

It may be interesting to give a synopsis of the last statements published for the information of shareholders respecting the operation of three or four of the leading mines of Cobalt, selecting for this purpose the Nipissing, Crown Reserve, Kerr Lake and Coniagas mines.

Nipissing

The fifth annual report of the Nipissing Mines Company, which is the holding company, being for the calendar year 1909, shows receipts of $1,535,000 by way of dividends on 2,500 shares of Nipissing Mining Company, the operating concern, which, with surplus on hand 1st January and interest, makes up an income of $1,543,989.40. Of this $1,500,000 was paid out as dividends, and $22,018.12 for expenses, leaving on hand the sum of $21,971.28. The statement of the Nipissing Mining Company for the same period, which follows immediately in the printed report, shows that during the year there were 6,230 tons of ore shipped (dry weight) and 183 tons of concentrates. Of this 1,048 tons were high grade ore of an average tenor of 3,094 ounces of silver per ton, 5,174 tons of low grade silicious ore averaging 212 ounces per ton, and 7.62 tons of nuggets averaging 19,771 ounces. The concentrates averaged 855 ounces per ton. The gross silver contents of the shipments were 4,646,877 ounces, having a value of $2,395,430, the average price per ounce received being 51.547 cents. The working account showed the total

Table VIII.—Statement of Dividends Paid by Silver Cobalt Mining Companies

Name of Company.	Date of Incorporation.	Authorized Capital.	Capital Stock issued.	Par value per share.	Amount of Dividends or Bonuses declared to end of 1908.	Amount of Dividends or Bonuses declared during 1909.	Total of Dividends or Bonuses declared to Dec. 31, 1909.	Date of last Dividend or Bonus.	Rate of last Dividend and Bonus.
		$	$	$	$ c.	$ c.	$ c.		per cent.
Buffalo Mines, Limited	April 27, 1906	1,000,000	1,000,000	1.00	317,000.00	320,000.00	637,000.00	Nov. 15, 1909	3
City of Cobalt Mining Company, Limited	Oct. 5, 1906 Jan. 7, 1909	500,000 1,500,000	1,500,000	1.00	44,483.70	94,828.72	139,312.42	April 15, 1909	3
Cobalt Central Mines Company	Dec. 13, 1906	5,000,000	5,000,000	1.00	95,230.00	97,615.00	192,845.00	Aug. 25, 1909	1
Cobalt Silver Queen, Limited	April 1, 1906	1,500,000	1,500,000	1.00	315,000.00	.....	315,000.00	Dec. 1, 1908	5
Coniagas Mines, Limited	Nov. 26, 1906	4,000,000	4,000,000	5.00	800,000.00	360,000.00	1,160,000.00	Nov. 1, 1909	3
Crown Reserve Mining Company, Limited	Jan. 16, 1907	2,000,000	1,999,957	1.00	353,762.80	1,238,169.80	1,591,932.60	Dec. 31, 1909	15
Foster Cobalt Mining Company, Limited	Feb. 14, 1906	1,000,000	915,588	1.00	45,000.00	.....	45,000.00	Jan. 1, 1907	5
Kerr Lake Mining Company, Limited	Aug. 15, 1905	40,000	40,000	100.00	840,000.00	750,000.00	1,590,000.00	Dec. 1, 1909	600
La Rose Mines, Limited	Feb. 21, 1907	6,000,000	6,000,000	1.00	420,000.00	995,000.00	1,415,000.00	Dec. 20, 1909	2½
McKinley-Darragh-Savage Mines of Cobalt, Limited	April 17, 1906	2,500,000	2,247,692	1.00	246,458.32	337,100.30	583,558.62	July 15, 1909	5
Nipissing Mining Company, Limited	Dec. 16, 1904	250,000	250,000	100.00	2,820,000.00	1,535,000.00	4,355,000.00	Dec. 20, 1909	7½
Right of Way Mining Company, Limited	July 13, 1906 Sept. 11, 1909	500,000 2,000,000	499,518 1,685,500	1.00 1.00	139,822.27	184,821.66 33,710.00	324,643.93 33,710.00	Oct. 1, 1909 Dec. 31, 1909	6 2
Temiscaming and Hudson Bay Mining Company, Ltd.	July 29, 1903	25,000	7,761	1.00	1,008,930.00	162,981.00	1,171,911.00	Nov. 22, 1909	300
Temiskaming Mining Company, Limited	Nov. 16, 1906	2,500,000	2,499,171	1.00	359,156.25	150,000.00	509,156.25	March 31, 1909	6
Trethewey Silver Cobalt Mine, Limited	May 30, 1906	1,000,000	1,000,000	1.00	217,453.50	244,545.00	461,998.50	Dec. 15, 1909	15
Total		33,315,000	31,745,212	.....	8,022,296.84	6,503,771.48	14,526,068.32	.....	....

cost of operating the mine to be $383,152.11, of which the principal items were Development and Exploration, $144,714.03; Stoping, $81,684.86; Ore Sorting and Loading, $33,943.01; Insurance and Taxes, $27,205.34; Trenching, $26,668.91; General and Legal Expenses, $21,197.17. Concentration of ore cost $35,433.96; Marketing Ore, $263,223.83; Corporation, New York Office and Travelling Expenses, $12,483.13; and there was allowed for depreciation, $49,798.84. Shafts and Tunnels charged to Operation were put down at $71,039.18. Miscellaneous income amounting to $40,320.16 being deducted, the total cost of production was $774,810.89, or at the rate of $121.22 per ton of ore produced, or $0.1639 per ounce of silver. The apparently large cost of "marketing ore," $263,223.83, is explained by the details: Smelter deductions on silver, $119,821.77; treatment charges, $47,966.96; freight, $71,688.30; Assayers, Metallurgists, Smelter Representatives and Ore Insurance, $20,633.77; and Commission, $3,113.43. Adding receipts for cobalt, $19,832.91, and nickel, $14.04, the gross value of the ore produced was $2,462,039.67; deducting the total cost of production left a profit of $1,687,228.78. The report shows that the total shipments from the mine, beginning with 1904, were 14,862 tons, containing 12,747,648 ounces of silver, and that the value of the silver, cobalt, nickel and arsenic paid for was $7,422,707.09, the net returns from smelters being $6,694,460.83. Reserves of ore were placed at 6,539,200 ounces of silver, valued at $3,269,600. The net surplus of the Nipissing Mining Company, after allowing for accrued expenses on ore, accounts payable and January dividend, was $913,195.46, of which $813,347.89 was cash in bank. The capital stock of the Nipissing Mines Company is $6,000,000, and of the Nipissing Mining Company $250,000. The dividends for the year, if calculated on the former, were equal to 25 per cent., if on the latter to 600 per cent.

Crown Reserve

From sales of ore the Crown Reserve Mining Company, in 1909, realized $2,080,156.08. The expenses were: Mining, including Development and Depreciation, $265,813.09; Freight and Treatment charges and deduction made by smelters, $184,671.16; Bonus to Employees, $12,611.95; Royalty to Ontario Government (10 per cent., less proportion of expenses), $180,661.39; total, $643,757.59, leaving a profit for the year of $1,436,398.49. Out of this were paid dividends amounting to $1,238,169.80, and $549,275.42 was carried forward to next year. The quantity of silver produced was 4,034,325 ounces. Expenditure on buildings, machinery and equipment from the time the mine was opened up to 31st December, 1909, was $137,054.05. The capital stock of the company is $2,000,000, and $1,591,932.60 have been returned to shareholders in dividends. Excluding the royalty payments, the above figures show the cost of producing silver to be 11.47 cents per ounce.

Kerr Lake

The capital stock of the Kerr Lake Mining Company is $3,000,000, being composed of 600,000 shares of a par value of $5 each. The mining property consists of 57 acres at Kerr Lake, in Coleman township. The company's published report for the year ending 31st August, 1909, shows that the production for the year amounted to 2,668,648 ounces of silver from 1,072 tons of ore, the average contents of which were 2,489 ounces per ton, and 300 tons of screenings. The gross value of the silver at 50 cents per ounce was $1,334,324; actual proceeds of sales, with adjustments for ore mined, on hand and in transit, 31st August, 1908, and 31st August, 1909, were $1,382,290.15. Adding interest, $4,254.22, the total receipts were $1,386,544.37. Cost of Production and Development was $200,050.35; of Shipment, Treatment and other charges, $47,288.60; and of Administration and General Expenses, New York, $10,157.88, leaving a net profit of $1,129,047.54. The chief items in the working expenses were: Development, $82,078; Mining, $71,861.39; Taxes, $17,143.49; Ore Sorting, $12,501.36; Repairs, $3,581.99; Stable Expenses, $3,264.75; General Expenses, $3,006.15; Office Expenses, $2,957.60. Ore treatment cost $17,263.27; Concentration, $13,290.61; Freights, $8,881.10; Insurance, $2,388.20; and Shipment expense, $2,630.12. The cost of producing and marketing the silver was 12.38 cents per ounce. The Kerr Lake Mining Company, Limited, capital $40,000, is the operating

company, and shows a balance on hand at the end of the year of $962,217.48. It is noted in the report that the deepest workings of the mine, in No. 3 shaft, were now down 350 feet, where there was pay ore. One drift on No. 7 vein at the 150-foot level, 60 feet long and 9 feet wide, produced 94,000 ounces of silver. There were two miles of underground workings.

Coniagas

The financial report of the Coniagas Mines, Limited, for the year ending 31st October, 1909, shows assets of $4,561,626.18, the principal items of which are: Mines and Minerals, $3,985,700; Coniagas Reduction Company, $151,971.85; ditto stock, $100,000; and Imperial Bank, $128,477.34. Against this the liabilities are: Capital Stock, $4,000,000; dividend payable, $120,000; and one or two minor items, leaving surplus to balance, $440,013.92. The "Working Account" shows on the debit side the expenses of operating for the year, such as: Mining, $78,274.57; Milling and Sorting, $39,143.63; Fuel, Oil and Waste, $29,842.56; Camp Expense, $15,261.65; Head Office and Administration, $14,368.50; Taxes and Royalties, $13,330.69; Mines Office and Supervision, $10,200.13, etc., in all $214,169.06. On the credit side the chief items are: Ore Revenue, $674,889.27; Camp Revenue, $13,478.23; total, $691,579.90; surplus closed into Loss and Gain account, $477,410.84. The Loss and Gain account shows that three dividends of $120,000 each were paid the shareholders; Bonus to Employees, $2,474.98; Directors' Fund, $1,500; leaving a balance of $440,013.92. During the year the production of ore and concentrates amounted to 776 tons, containing 1,407,228 ounces of silver; for the whole life of the mine so far the mine had yielded 4,347½ tons of ore, and concentrates carrying 4,863,323 ounces. In all, 60,229 tons of ore and rock had been removed during that time, of which 33,229 tons of rock were put through the concentrating mill. The estimate of ore in sight was: High grade 3,427 tons, containing 9,125,500 ounces of silver; and milling rock 103,000 tons, containing 3,432,200 ounces; total, 12,557,700 ounces. The cost of producing and selling the silver product, deduced from the foregoing figures, was 15.21 cents per ounce.

The silver production of these four mines last year, and the cost of producing and marketing the same per ounce, were as follows:—

	Silver produced, oz.	Cost per oz., $
Nipissing	4,646,877	0.1639
Crown Reserve	4,034,325	0.1147
Kerr Lake	2,668,648	0.1238
Coniagas	1,407,228	0.1521

The Lesser Cobalts

Considerable progress has been made in the development of the lesser Cobalt silver fields, namely, South Lorrain, Gowganda, and the Montreal River generally. Much money has been spent and most energetic efforts have been made to prove the value of these several camps—efforts which have been deterred by no difficulty, however great, interposed by climate, distance or imperfect means of transportation.

There was a small output of ore from the Keeley mine in South Lorrain in 1908, and last year the Wettlaufer, in the same district, joined the producing ranks. The shaft on this mine had been sunk in March, 1910, to a depth of 152 feet, and two levels run, one at 60 and the other at 134 feet. Considerable drifting and cross-cutting had been done, and a good surface equipment provided of boilers, compressor plant, hoist, etc., as well as the necessary buildings. Other promising properties are the Newman, or R.L. 470, on which a good vein of calcite, smaltite and niccolite with native silver was found last autumn; the Haileybury Frontier, south half H.R. 16; Little Keeley, H.S. 40; Beaver Lake, H.R. 21; and Maidens, H.R. 690. The South Lorrain camp is waiting for electric power from the Matabitchouan, where the Mines Power, Limited, is developing a large water power. When this begins to be delivered, as it probably will be in the

spring of 1910, developments will be more easily and economically made. The production of silver in South Lorrain last year was 194,955 ounces, valued at $99,859; and from Maple Mountain 18,002 ounces, worth $8,421.

A good deal of ore was accumulated at several of the Gowganda mines during development operations carried on in 1909, some of it of first-rate quality. The summer roads not being fit for the transportation of such heavy material except at undue cost, the ore remained in the ore houses until winter—the great highway-maker of Northern Ontario—should enable it to be moved. The first consignments from Gowganda were made by the Millerett Silver Mining Company, Limited, from the mine on Claim M.R. 1081, in the township of Haultain, Temagami Forest Reserve, but as the ore was not loaded on the cars of the T. & N. O. Railway at Charlton until the first day of January, 1910, the shipments are not included in the production of 1909. This carload, which was consigned to the Canadian Copper Company's smelter at Copper Cliff, had a dry weight of 64,952 pounds, and contained 104,714 ounces of silver, an average of 3,224 ounces per ton. This was followed early during the present year by shipments from the same mine, and also from the Reeves-Dobie, Boyd-Gordon, Lucky Godfrey and one or two other properties, the total shipments for the first three months of 1910 from Gowganda and Montreal River being 320 tons. Part of this was brought out by the T. & N. O. railway from Charlton station, and part of it by the Canadian Northern, being delivered at Sellwood station by way of the road from Gowganda lake to that point. Shipments by the former route amounted to 230 tons, and by the latter 89 tons.

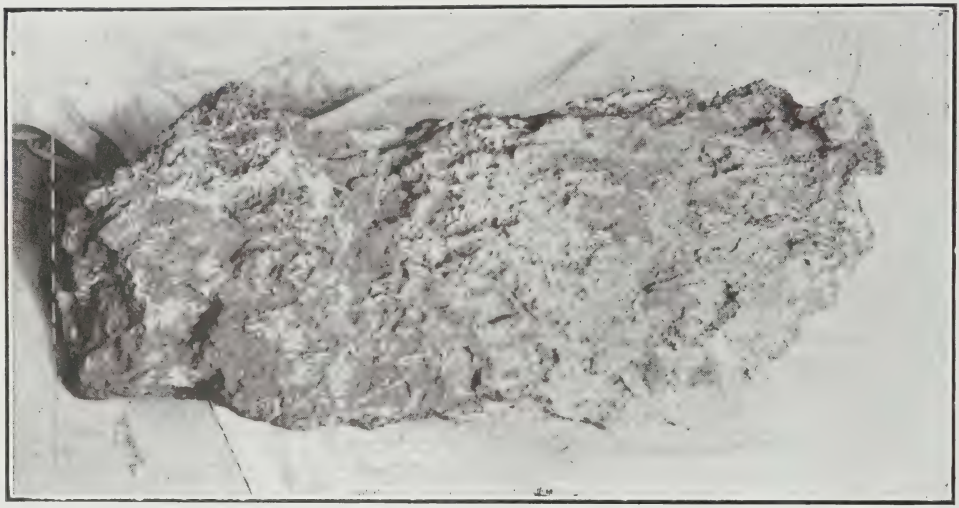
A Silver Specimen Worth Preserving

In prospecting on the Gem mining claim near Giroux lake (southwest part lot 3 in the fourth concession of Coleman township) a nugget or large piece of float was found which was almost completely covered by soil. This is the largest piece of rich float found in the Cobalt district up to the present time, and is probably the largest known block of silver ore now existing anywhere. The maximum dimensions are 5 feet 5 inches by 2 feet 5 inches by 1 foot 6 inches, as shown on accompanying photographs. The weight was 1,640 pounds. As can be seen, one part is exceedingly rich, consisting of native silver in plates, in places presenting the appearance of filagree work and in others forming into masses. This was undoubtedly the vein matter, the other part adhering country rock. The native silver is probably mixed with dyscrasite, as an assay of the selected metallic portion showed that it contained 90.32 per cent. silver, the impurity being antimony. The highest known percentage of silver in dyscrasite is 83.85. Mr. C. W. Knight's description, given below, of sections made from this country rock shows that it is Huronian greywacké, whereas the country rock on the claim is diabase. The plan given shows the nearest Huronian rock is about 3,000 feet distant. In all probability this float came from one of the large veins in the rich Kerr lake section. Mr. C W. Knight describes it thus:—

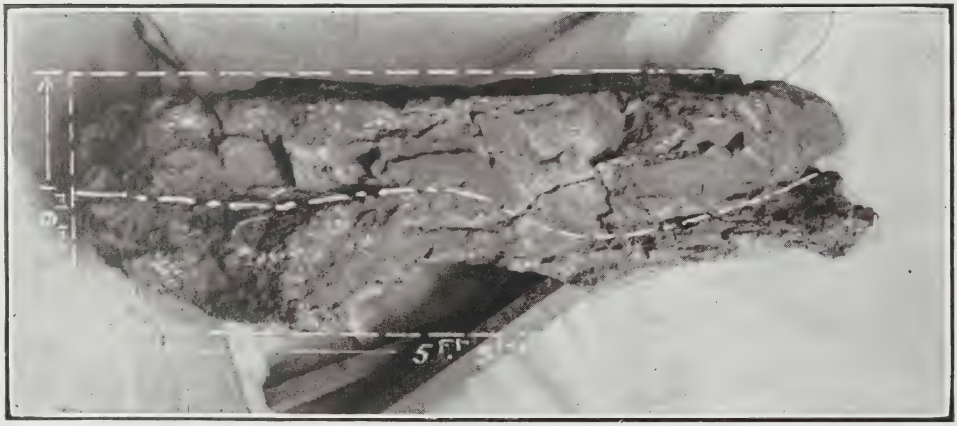
The rock is a fine-grained greywacké of Lower Huronian age, similar to the Cobalt greywackés. It consists partly of bits of the different rock types, basalt, feldspar—porphyry and chert, and partly of fragments of the simple minerals, quartz and feldspar. This material is set in a ground-mass made up of the same débris in a finer state of division, together with chlorite, epidote, zoisite and calcite.

This nugget appeared to be of so much interest, both as illustrating the transporting power of some agency, undoubtedly glaciers, and also the lavish way in which nature can act at times, that it deserved to be kept for all time and placed on view in a public museum, and not simply utilized as a source of silver. On representations being made to the Minister of Lands, Forests and Mines, he decided to save the nugget from the smelting furnace, and to purchase it from the owners for the value of the silver it contained. This was accordingly done, and the nugget is now on exhibition in the Parliament Buildings, Toronto.

The silver was masked to a great extent by discoloration and a coating of cobalt bloom; this was cleared off in places by the use of a sand blast, and the result was to show the block to be much richer in silver than it previously appeared to be. No smaltite was disclosed by the action of the sand blast. As only two constituents existed in large quantities in the mass (the cobalt bloom being relatively insignificant in amount), and as the country rock and calcite of the vein matter were nearly identical

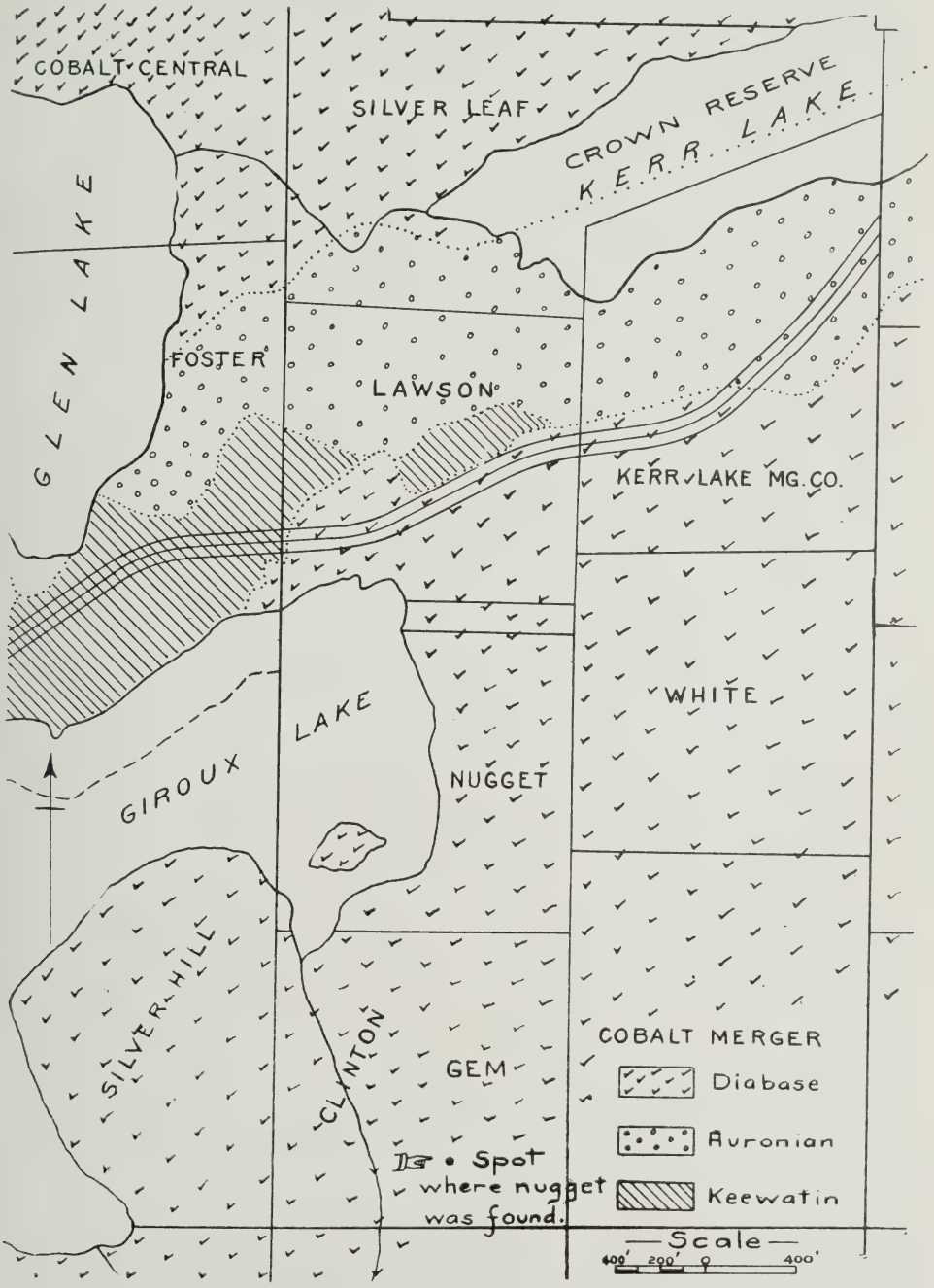


Photograph of Cobalt Gem silver nugget. Practically the whole surface shown is silver.



Side view of nugget, showing rock matter overlaid by silver.

in specific gravity, it was possible to determine the amount of silver without mutilating the nugget, by taking the specific gravity of the block as a whole and from this calculating the silver contents. Facilities for this were kindly furnished in the mining building of the University of Toronto. The determination showed that there were 9,715 ounces of fine silver in the mass, and settlement was made at the current market price of silver.



Plan showing spot on Gem property, Cobalt, where nugget was found.

As stated before, probably no nugget is known at the present time to compare with this in size. In Schneeberg, according to Beck, Erzlagerstätten, p. 368, and Stelzner, Erzlagerstätten, Part II., p. 727, a block of ore was found weighing 20 tons and measuring 12 feet by 6 feet, length and breadth. Fragments of this are in the Dresden museum to-day; they consist of silver, argentite, ruby silver and horn silver. As the gangue matter in the Schneeberg veins was principally barite with fluorite and calcite, and therefore with specific gravities of 4.5 to 2.7, and the metallic minerals had specific gravities of 10.6 down to 5.5, it is probable that the specific gravity of the whole mass was somewhere about 5 or less; the other dimensions would then be 1 foot 9 inches—the probable width of the vein. This calculation agrees with the historical records, which show that in 1474 the Grand Duke of Saxony was entertained at a banquet underground, at which the block of ore was used for a table.

Typhoid Fever and Sanitation

An outbreak of typhoid fever visited the mines of Cobalt last summer, along with the towns and settlements of northern Ontario generally. The conditions pertaining to water supply and sanitation in mining camps and towns which are rushed up under the influence of a "boom" are such as to afford every facility for epidemics of this kind, if not practically to invite them, but there is no reason to believe that the mines themselves were worse in this respect than the towns and villages. Indeed, most of the mines showed a cleaner bill of health than the other centres of population, and not infrequently typhoid cases appearing in the mines could be traced to the settlements. Greatly to the credit of the mining companies, they organized and maintained largely at their own expense a Red Cross hospital at Cobalt for miners suffering either from typhoid or any other disease, or from accidental injury. The management and operation of the hospital was very successful, and did much to alleviate the severity of the epidemic. The hospital has since been incorporated, with the mining companies as the shareholders, and future visitations can be coped with from the beginning. So far as the town of Cobalt is concerned, a supply of good water is being obtained from lake Sasaginaga, which will go far to minimize the danger of typhoid epidemics.

Cobalt

The cobalt oxide trade is at present demoralized, and is likely to remain in this condition until a greatly increased use of the article enables the demand to overtake the supply. The enforced production of cobalt ore from the mines of Cobalt has resulted in a much greater quantity of ore than can be converted into oxide and marketed as such. In fact, one year's operation of the Cobalt mines will produce ore enough to meet the present consumption of oxide for several years. The inevitable consequence has been a very decided fall in the price of cobalt oxide. Before the mines of Cobalt were opened, the ruling price was about $2.50 per pound, while now it is 80 or 85 cents per pound. Cobalt ore cannot at present be sold, and none is being raised from any of the silver-free veins of the Cobalt camp, the entire production being of ore associated with silver. The refining works at Deloro and Thorold will, it is expected, soon enter the market with cobalt products, which will not tend to an increase of price. The only hope of absorbing the cobalt contents of the ores which will continue to be produced in Ontario is in an enlarged demand, brought about either by the low levels to which the prices have fallen, or by new uses for the product. It is not unreasonable to expect that the former will lead to the latter.

Owing to the fact that no value is attached to a large proportion of the cobalt constituents, accurate records of the actual production are wanting, but for statistical purposes it is here assumed that the ores and concentrates shipped from the Cobalt mines last year contained on the average 5 per cent. of cobalt, which would give a production of 1,533 tons. Sales of cobalt yielded mine owners $94,965. The cobalt output, though for the present largely unmarketable, is not being thrown away, and the accumulations of past and future years will no doubt eventually find their way to utilization.

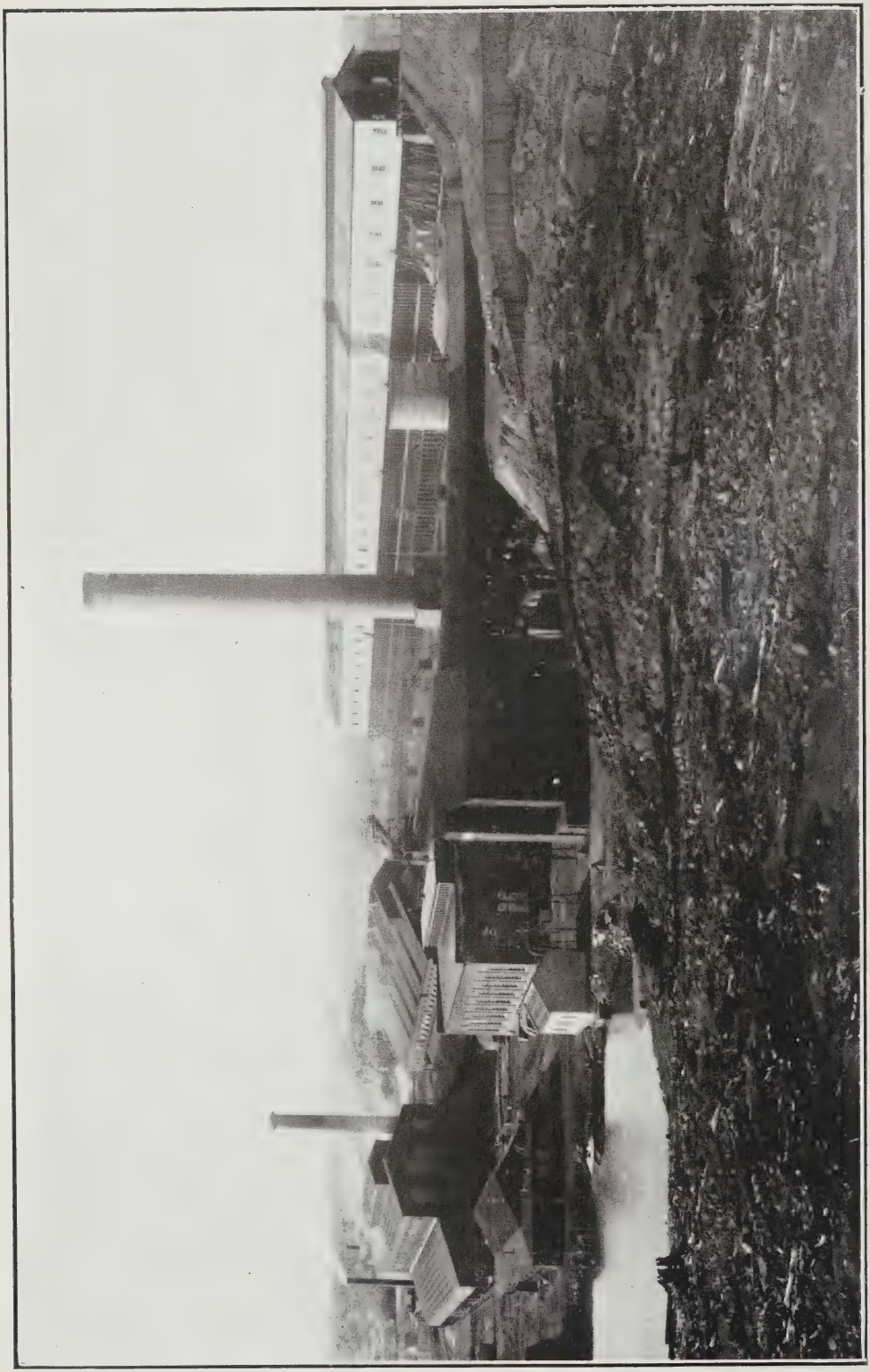
Nickel

The nickel-copper mines of the Sudbury region yielded last year 451,892 tons of ore. There were 462,336 tons charged into the smelters and converted into 25,845 tons of bessemerized matte, the estimated contents of which were 13,141 tons of metallic nickel and 7,873 tons of metallic copper. In 1908 the mattes produced amounted to 21,197 tons, containing 9,563 tons of nickel and 7,501 tons of copper, the output of nickel for 1909 being thus 37 per cent. greater than in 1908. The estimated nickel contents of the ore raised from the silver-cobalt mines of Cobalt were 766 tons, computed at 2½ per cent., making a total nickel yield of 13,907 tons. No value is ascribed in the tables of production to the nickel from Cobalt, since little or none of it so far has been utilized This, however, may not continue to be the case, and in any event the nickel of the Cobalt ores, being the product of Ontario mines, is entitled to be reckoned as such, regardless of its present value. The whole nickel output is returned as being worth $2,790,798, and the copper contents of the Sudbury mattes at $1,122,219.

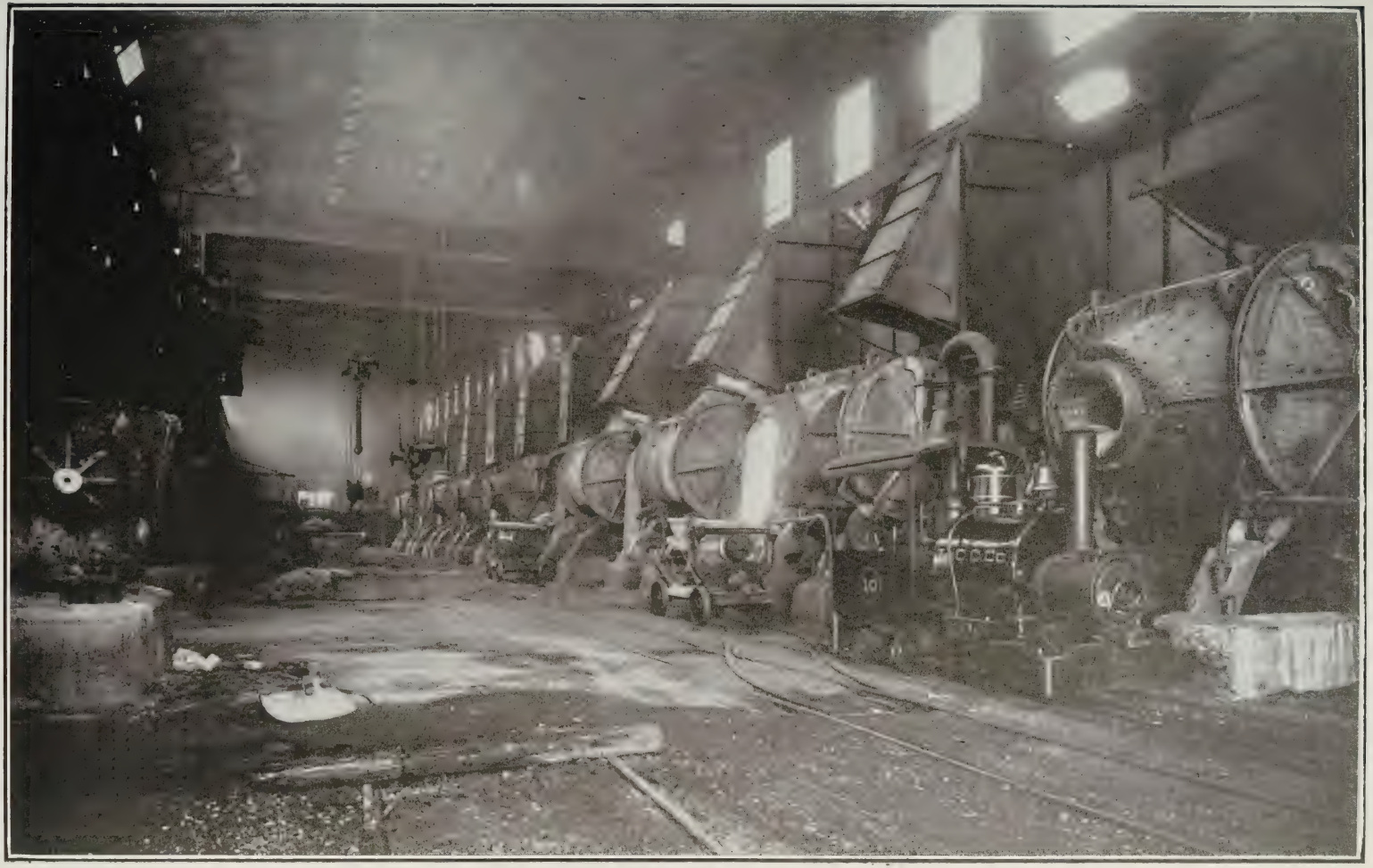
The Canadian Copper Company continues to lead in the production of nickel, their works at Copper Cliff being fully occupied during the past year. The ore treated by them was extracted from the following mines:—Creighton, 245,573 tons; Crean Hill, 100,312 tons; Vermilion, 702 tons; and Evans, 2,713 tons.

Monel Metal

In the last Report of the Bureau mention was made of "Monel metal," a natural alloy of nickel and copper, which is being produced from the Canadian Copper Company's mattes without previous separation of the metals. It contains about 68 per cent. of nickel, 1½ per cent. of iron, the remainder being copper, and greatly resembles the former metal in appearance. It is claimed to be non-corrosive, and owing to its being made direct from the matte, it can be produced and sold at a price which enables it to compete with bronze, German silver, etc. Monel metal sheets are being used, among other purposes, for the roofing of buildings, for which it is said to be superior to copper. The roof of the large terminal of the Pennsylvania Railroad in New York was made of this alloy, 250,000 square feet of roofing, in addition to cornices, gutters, leaders, etc., requiring over 150 tons of the material. For the roof of the Chicago and North Western Railway station in Chicago, equal in extent to four city blocks, 75 tons of Monel metal will be used, and 109 tons for the buildings of the Orford Copper Company at Bayonne, New Jersey, having a roof area of 140,480 square feet. For mine screens it is replacing manganese bronze in the anthracite regions of Pennsylvania, on account of its resistance to the corrosive action of the sulphuric acid present in the wet coal passing over the screens. The same property gives it value where metals are affected by salt water or acid solutions, as in propeller blades, yacht and steam launch construction, and other shipbuilding uses, and for vessels employed in chemical works for handling corrosive liquids. Owing to its high melting point, "Monel metal" is somewhat difficult to cast, special equipment being required for the purpose. It comes in castings, hot rolled sheets, cold rolled sheets, bars, rods and wire. A lathe can be run at the same speed with "Monel metal" as with ordinary steel, and there is no difficulty in forging, soldering, brazing or electrically welding it. Its melting point is 1,360 deg. C. (2,480 deg. F.); specific gravity (cast), 8.87; weight per cubic inch, 0.319 lb.; co-efficient of expansion (20 deg. C.—100 deg. C.), .00001375 per 1 deg. C.; electrical conductivity 4 per cent., as compared with copper 100 per cent.; heat conductivity, one-fifth that of copper; modulus of elasticity, 23,000,000; shrinkage, one-quarter inch per foot. There would appear to be a wide field of usefulness open to this new alloy, and for pumps and other uses in mines where the water is bad and corrodes ordinary steel it would seem to have special advantages.



General View of Smelter, Canadian Copper Company.



Converter Departments, Canadian Copper Company.

The Mond Nickel Company,[4] whose works are at Victoria Mines, brought to the surface 102,592 tons of ore, of which 38,311 tons came from Victoria Mine No. 1, Denison township, and 64,281 tons from the Garson Mine, Garson township.

The Dominion Nickel Copper Company have been engaged in building a line of railway from the Canadian Northern through the township of Norman to the Whistle Mine and other properties near Blue lake, but so far have not begun to raise ore.

No further developments have taken place with regard to the nickeliferous pyrrhotite bodies found in Dundonald and Clergue townships, west of the T. & N. O. Railway, mentioned in the Eighteenth Report.

The following statistics show the progress of the nickel-copper mining and smelting business during the five years ending with 1909:

Table IX.—Nickel-Copper Mining, 1905 to 1909

Schedule.		1905.	1906.	1907.	1908.	1909.
Ore raised	tons	284,090	343,814	351,916	409,551	451,892
Ore smelted	"	257,745	340,059	359,076	360,180	462,336
Bessemer matte produced	"	17,388	20,364	22,041	21,197	25,845
Nickel contents	"	9,503	10,776	10,602	9,563	13,141
Copper contents	"	4,525	5,260	7,003	7,501	7,873
Value of Nickel	$	3,354,934	3,839,419	2,270,442	1,866,059	2,790,798
Value of Copper	"	688,993	806,413	1,020,913	1,062,680	1,122,219
Wages paid	"	833,822	1,117,420	1,278,694	1,286,265	1,234,904
Men employed	No.	1,176	1,117	1,660	1,680	1,796

The figures at which the nickel and copper contents are valued in the above table are those placed upon them by the mining companies themselves. They correspond to 10.6 cents per pound for nickel, and 7.1 cents per pound for copper. For the former metal the value seems low, compared with 40 cents per pound, the minimum quotation for refined nickel in New York during the year. It is quite probable, however, that for large contracts sales are made at a considerably smaller figure.

In "heap-roasting" the green ore some 17,642 cords of wood were consumed, costing $53,988, or $3 per cord, and in smelting the roasted ore and converting it into a bessemer matte containing about 80 per cent. of metallic contents 76,138 tons of coke were required, valued at $552,642, or $7.25 per ton.

Copper

The output of copper is largely dependent upon that of nickel, since the source of nearly all the copper produced in this Province is the cupriferous pyrrhotite of the nickel mines of Sudbury. The production from these mines amounted last year to 7,873 tons, a larger quantity than in 1908, but not proportionately so to the tonnage of ore smelted, which was much greater than in 1908. In the latter year there were put through the smelters 360,180 tons of ore, the resulting copper in the matte being estimated at 7,501 tons, while in 1909 462,336 tons of ore yielded 7,873 tons of copper.

[4] The Mond Nickel Company has had a successful career. The company dates back to 1901, and, as shown by the *London Statist* of July 2, 1910, the net profits and dividend payments during the last eight years have been as follows:—

Year.	Net profit. £	Dividend on Ordinary shares. per cent.	Deferred Dividend per cent.
1903	2,095	..	..
1904	17,197	..	..
1905	30,916	6	..
1906	56,515	10	18
1907	100,665	12½	33
1908	125,007	15	48
1909	117,179	15	48
1910	120,112	15	48

—a total net profit of £569,586, or say $2,768,197. The capital of the company is £750,000, divided into £400,000 7 per cent. cumulative preference shares, £300,000 ordinary shares, and £50,000 deferred shares. £5 preference shares are quoted at 6¾, and £1 ordinary shares at 2¾.

The only non-nickeliferous copper mines in operation last year were Bruce Mines and Hermina, whose combined shipments are estimated to have contained 60 tons of copper. Bruce Mines, fifty years ago, was a busy place, where the Cornish miners earned good wages and turned out a great deal of copper ore, which, dressed by the methods then in vogue up to 18 or 20 per cent., was shipped to Swansea or, until the duty became prohibitive, to the United States. The fitful efforts to resume the working of the deposits which have been made from time to time have not resulted in much success, but the property has now passed into the possession of a company headed by Mr. R. W. Leonard, of St. Catharines, who is also president of The Coniagas Mines, Limited, the well-known silver mine at Cobalt. It is proposed to thoroughly explore the veins and to work them to the best advantage. The widespread occurrence of copper sulphide ores in that part of the Province adjacent to the north shore of Lake Huron affords ground for the belief that when local facilities are provided for the successful smelting of these silicious ores, this region will become an important producer of copper.

Iron Ore

Five iron mines last year produced 263,777 tons of ore. Of these, two yielded hematite, namely, the Helen mine, Michipicoten, owned by the Lake Superior Corporation, and the Dominion Bessemer Ore Company's property, near Loon lake, east of Port Arthur; and three magnetite—Moose Mountain, Atikokan and Bessemer (formerly Mineral Range), in Mayo township, Hastings county. The output of hematite was 197,193 tons, and of magnetite 66,584 tons, the value of the whole being returned as $645,622.

The ore shipped by the Dominion Bessemer Ore Company was the first taken from the flat-lying beds of hematite which have for some years been known to exist in the rocks of the Animikie formation in and near the township of McTavish, on the north shore of Lake Superior. These rocks and the accompanying ore bodies are described by Mr. W. N. Smith in the Fourteenth Report of the Bureau of Mines (1905), pp. 254-260, and also by Mr. L. P. Silver in the Fifteenth Report, pp. 156-172.

The Lake Savant iron range area is described in this report by Dr. E. S. Moore, who has explored, first as assistant to Dr. A. P. Coleman, late geologist and metallurgist on the Bureau's staff, and afterwards independently, a number of the localities in Northern and North-western Ontario in which the iron formation is developed.

Pig Iron and Steel

The seven blast furnaces in Ontario were all operated last year, most of them continuously. The Algoma Steel Company, Sault Ste. Marie, and the Hamilton Steel and Iron Company, Hamilton, have two furnaces each; the Canada Iron Corporation, Midland, the Standard Chemical Works, Deseronto (formerly Deseronto Iron Company), and the Atikokan Iron Company, Port Arthur, one each. The output of pig iron was 407,013 tons, valued at $6,301,528, as compared with 271,656 tons, valued at $4,390,839, in 1908. Of steel, which is made by the Sault Ste. Marie and Hamilton plants, the output was 296,031 tons, valued at $6,759,960. At Sault Ste. Marie the product was confined to standard T rails, the whole output of the blast furnaces and a large quantity of purchased pig being converted into this article. At Hamilton the product was basic open-hearth steel, 76,085 tons being in the shape of ingots and 700 tons steel castings. In the other departments of the Hamilton Company's extensive plant the products of the furnace were further developed into 3,359 tons billets, 289 tons miscellaneous forgings, 3,788 tons spikes, 626 tons axles, and 73,071 tons bar iron and steel.

Details of the blast furnace operations are found in the following figures:—

Ontario ore smelted	tons	220,307
Foreign " "	"	543,544
Scale and mill cinder	"	14,486
Limestone for flux	"	226,991
Coke for fuel	"	436,707
Value of do	$	1,985,296

Charcoal for fuel	tons	973,413
Value of do	$	102,208
Pig iron product	tons	407,013
Value of do	$	6,301,528
Workmen employed	No.	1,125
Wages paid	$	689,818

The Ontario Iron and Steel Company, in its works at Welland, produced a quantity of open-hearth basic steel from scrap material, along with about 100 tons of imported iron ore. The Electro-Metals Company, of the same place, are carrying on a large business in the manufacture of ferro-silicon, the raw materials being iron ore imported from the United States, and silica in the form of rock or flint, brought from Frontenac county or Parry Sound district. The company makes use of about 7,000 electric horse power in its furnaces and works.

Table X. gives the figures for the iron and steel making plants of Ontario for five years ending with 1909:—

Table X.—Production Iron and Steel, 1905 to 1909

Schedule.	1905.	1906.	1907.	1908.	1909.
Ontario ore smelted tons	61,960	101,569	120,156	170,215	220,307
Foreign ore smelted "	383,459	396,463	388,727	342,747	543,544
Limestone for flux "	121,052	153,702	171,037	179,741	226,991
Coke "	262,415	304,676	326,937	322,817	436,707
Charcoal bush.	3,387,869	811,926	1,849	.....	973,413
Pig iron tons	256,704	275,558	286,216	271,656	407,013
Value of pig iron $	3,909,527	4,554,247	4,716,857	4,390,839	6,301,528
Steel tons	138,387	167,026	237,855	172,108	296,031
Value of steel $	3,321,884	4,202,278	4,168,127	4,397,082	6,759,960

Zinc

The production of zinc ore last year was 895 tons, all from the county of Frontenac. Some London (Ont.) parties have done a little development work on lots 29, 30 and 31, in the third concession E.B.R., Albemarle township, Bruce county, where showings of zinc ore have been found in the limestone.

Construction Materials

These are brick, lime, stone and cement.

Brick

As compared with 1908, the output of common brick rose from 222,361 thousand to 246,308 thousand last year, and the value from $1,575,875 to $1,916,147. There was a decided increase also in the value per thousand, the average being $7.78, as compared with $7.09 in 1908. The demand for brick was active during the year, especially in the larger cities, building operations in Toronto, for instance, which is essentially a city of brick, being decidedly brisk. A large quantity of brick is manufactured in and around Toronto, many of the brickyards being extensive and well equipped. Reference to the figures published by the Bureau as to the production of brick shows that the average value at the yard has risen from $5.73 per thousand in 1901 to $7.78 per thousand in 1909, an increase of over 35 per cent. The cost of brick constructions has been heavily affected during the same time, since the cost of labor has experienced an advance probably quite as great.

There has of late years been a marked improvement in the quality of brick made in first-class yards. Kilns of modern construction burn harder and more evenly, and there is a smaller proportion of soft brick. The present taste in brick houses, too, does not demand the same uniformity of color that was formerly insisted upon; in fact, a variety of shade, instead of being objected to, is rather desired. There is also a much greater range of products than was made years ago. From white and buff to cherry red and up

to a dark, even purplish, hue, bricks of all tints and shades are freely used, and pleasing effects are sometimes obtained by employing clinker or over-burned bricks, greenish or yellowish in color. The hard-burned bricks of the present day bid fair to give us durable towns and cities, not perhaps so handsome as those built of stone, but less subject to disastrous conflagrations than those made of wood, so much employed south of the line.

Of all varieties of brick there were made last year $2,480,418 worth, comprising common $1,916,147, pressed $490,571, and paving $73,700. In the brick and tile yards there were 3,166 men employed, earning $961,881 in wages. The brick-making season is for the most part confined to the months of late spring, summer and early fall. This, and not a low rate of wages, accounts for the comparatively small earnings of brick-makers, which last year averaged only $303.

Lime and Stone

The activity in building operations last year is reflected in the increased output of lime, of which 2,633,500 bushels were made, as compared with 2,442,331 bushels in 1908. The value also went up to $470,858, as against $448,596.

The building trade in Ontario is well served, not only by the abundance of clay suitable for the making of brick, but also by the widespread distribution of limestone which can be burned into lime. In composition the rock varies from nearly pure carbonate of lime to dolomite, in structure from crystalline to fossiliferous, and in geological age from Archean to the upper members of the Devonian series, but almost all kinds will make good lime. The idea that highly magnesian limestones are unfitted for lime has been shown to have no foundation.

The value of the building and crushed stone produced last year was $660,000, of which $228,000 worth was limestone used as flux in blast furnaces. The output of the stone quarries in Ontario varies from year to year, not only in accordance with the fluctuations in the building trade, but also in accordance with the demand for large public works. It is also adversely affected by the growing use of cement, which is being more and more applied to uses for which stone was formerly employed. The greater part of the product is limestone.

Portland Cement

The only kind of cement now being made in the Province is Portland cement, the manufacture of the natural rock variety having come to an end in 1907. Of Portland cement, however, the output has been annually increasing since 1891, when the industry began. Last year there were made 2,303,263 barrels, valued at $2,897,348, as against 2,022,877 barrels, worth $2,417,769 in 1908, the average price for last year being $1.257 per barrel at the factory, as compared with $1.195 in 1908, an increase of $0.061 per barrel.

The chief feature of interest in the industry last year was the formation of the Canada Cement Company, Limited, with headquarters at Montreal, a "merger" which united under one management the following plants in Ontario, as well as three factories in Quebec and one in Alberta, namely, Lehigh, Belleville, Marlbank, Port Colborne, Lakefield and Shallow Lake. The following companies were absorbed by the merger: Belleville Portland Cement Company, Belleville; Lehigh Portland Cement Company, Belleville; Canadian Portland Cement Company, Marlbank and Port Colborne; Lakefield Portland Cement Company, Lakefield; Owen Sound Portland Cement Company, Shallow Lake. There now remain outside of the "merger" the following cement companies in Ontario: Maple Leaf Portland Cement Company, Atwood; Grey and Bruce Portland Cement Company, Owen Sound; National Portland Cement Company, Durham; Superior Portland Cement Company, Orangeville; Imperial Portland Cement Company, Owen Sound; Crown Portland Cement Company, Wiarton (formerly Colonial Portland Cement Company); Ontario Portland Cement Company, Blue Lake; Hanover

Portland Cement Company, Hanover; Kirkfield Portland Cement Company, Kirkfield; Ben Allen Portland Cement Company, Owen Sound; and Sun Portland Cement Company, Owen Sound. Of these the Imperial, Crown and Ben Allen companies were idle throughout the year, and the Maple Leaf and Grey and Bruce operated for part of the year only. The output of the independent companies was small compared with that of the combine, which produced the bulk of the cement made last year. The industry gave employment to 1,354 men, whose wages amounted to $631,137.

Drain Tile and Sewer Pipe

The number of drain tile made last year was 27,418,000, having a value of $363,550. Tile draining is being more and more practised by the farmers of Ontario, who recognize the advantage of freeing their low-lying lands of surplus moisture, which retards the growth and maturing of their crops and invites early frosts. The production in 1908 was valued at $338,658.

Of four sewer pipe factories, three were in operation in 1909, namely, those of the Hamilton and Toronto, Dominion, and Ontario Sewer Pipe companies. The output had a value of $311,830, as against $344,260 in 1908.

From the potteries of Ontario there were turned out in 1909 $43,214 worth of goods.

Arsenic

The silver-cobalt ores of Cobalt are the source of all the arsenic at present being produced in Ontario, though they are by no means the only arsenical deposits. In Hastings county, as is well known, there are important bodies of arsenopyrite, some of it auriferous, which in times past have been operated vigorously. There are similar ores at Arsenic lake, Temagami Forest Reserve, and elsewhere in northern Ontario. If the demand for arsenic were such as to require a larger output, there would be little difficulty in materially increasing the production.

From the silver-cobalt refineries at Copper Cliff, Deloro, and Thorold there were shipped last year 1,085 tons of white arsenic, valued at $61,039, or 2.81 cents per pound. In 1908 the output was 702 tons and the value 2.87 cents per pound. Besides this, some 537 tons of arsenic were contained in the speiss product of the refining works, a large part of which was sent abroad for treatment. In all, the total production of arsenic is estimated to have been 4,303 tons, allowing the average arsenic contents of the ore and concentrates shipped from the Cobalt mines to have been 14 per cent. No returns are received by the ore producers for arsenic. The value, $61,039, shown in the table of production is wholly for the shipments of white arsenic made by the refining companies.

Iron Pyrites

There were shipped from the iron pyrites mines of the Province last year 28,946 tons of ore, valued at $78,170, an increase over 1908 of 7,976 tons in quantity and $8,190 in value. The producing concerns were the Nicholls Chemical Company, whose mine and acid works are situated at Sulphide, Hastings county, the Northern Pyrites Company, who have begun shipping ore to the United States from an extensive deposit at Lake Minnitakie, near the junction of the branch of the Grand Trunk Pacific railway from Fort William with the main line, and the Northland Mining Company, whose deposits are at Rib lake, on the T. & N.O. railway, Temagami Forest Reserve.

The production of pyrite has been increasing during the last five years, as the following table shows:—

Table XI.—Production of Iron Pyrites, 1905 to 1909

Schedule.	1905.	1906.	1907.	1908.	1909.
Pyrites shipped ..... tons	7,325	11,090	15,755	20,970	28,946
Value of do ..... $	21,885	40,583	51,842	69,980	78,170
Workmen employed ..... No.	68	128	137	132	132
Wages paid ..... $	27,690	57,580	75,365	95,740	104,687

The preponderance of wages paid over value of output during the last four years is to be explained by the very considerable amount of preliminary or development work required in order to place some of the deposits in condition to ship, wages for construction as well as for mining being charged against the operations.

Mica

The amber mica of Ontario and Quebec is held in high repute because of its flexibility, thin-splitting properties and general suitability for use in the manufacture of electrical apparatus, the chief purpose for which mica is now employed. Returns to the Bureau show that there were produced in the Province last year 350 tons of rough-cobbed mica, valued at $73,124. There was not much change from the production of 1908, when 368 tons were reported, worth $73,586.

The largest producer was the Loughboro Mining Company. The Kingston Feldspar and Mining Company, Kent Bros. and J. M. Stoness, and Rinaldo McConnell, also contributed to the total. The mines of these companies and firms are in eastern Ontario, for the most part in Frontenac and Lanark counties; but in the districts of Parry Sound, Muskoka and Nipissing, scattered deposits are found in Laurentian rocks, which are occasionally worked in a tentative or experimental way. The mica from these districts is of fair quality, but owing to its being spotted with "iron stains," it is not regarded with the same favor as the product of standard mines in the older regions.

Salt

From the salt wells of the south-western peninsula there were produced last year 77,490 tons of salt, valued at $389,573. The operators were: The Canadian Salt Company, Windsor; Empire Salt Company, Sarnia; Western Canada Flour Mills Company, Goderich; John Ransford, Stapleton, Ontario; People's Salt and Soda Company, Kincardine; Western Salt Company, Mooretown; The Grey, Young and Sparling Company, Wingham; Exeter Salt Works, Exeter; Parkhill Salt Company, Parkhill; and Elarton Salt Works Company, Warwick.

There were employed in the industry 176 men, to whom wages were paid amounting to $89,995.

Petroleum

The petroleum wells of Ontario last year yielded 14,723,105 Imperial gallons of oil, valued at $559,478. The quantity given is that returned to the Department of Trade and Commerce, Ottawa, for purposes of the Dominion Government bounty of 1½ cents per Imperial gallon, and is furnished by the kindness of that Department. This is a decrease of 3,756,442 gallons, as compared with the production of 1908, or 25 per cent.

The decline in the oil yield, which has been commented on in previous Reports, continues to manifest itself in the records of production. There was a diminution in the output of every one of the fields, but the rate of decline in the newer districts of Tilbury and Romney was greater than in the older districts of Petrolea and Oil Springs. Already the production has sunk to less than one-half of what it was fifteen years ago, and if the falling-off is maintained the supply of domestic petroleum will tend to become relatively insignificant, unless new reservoirs are opened up. Even now more

crude oil is imported into the country than is produced here. The fields of Lambton county have already had great longevity, and are unique among the oil-producing regions of the world, because of the small individual production of the wells, which is only a few gallons a day, and of the economy with which they are operated. Being of shallow depth, many wells may be worked by one engine on the "jerker" system, and so give a profit, which if not large is constant.

Mr. W. J. Harvey, supervisor of crude petroleum bounties for the Dominion Government, furnishes a statement of the production in 1909 by fields, which is here reproduced, along with similar figures for the three preceding years:—

Table XII.—Petroleum Production by Districts, 1906 to 1909

Field.	1905.	1907.	1908.	1909.
	bbl.	bbl.	bbl.	bbl.
Lambton	377,286	304,212	265,368	243,123
Tilbury and Romney	106,992	411,588	201,283	124,003
Bothwell	44,827	42,727	39,228	38,092
Leamington	39,652	6,133	9,334	5,929
Dutton	19,376	14,977	13,743	9,513
Thamesville	175	237	.....	.....
Comber	651	.....	.....	.....
Total	588,962	779,876	528,959	420,660

As will be seen from the above statistics, the reduction in the yield of the respective fields was as follows: Lambton 22,245 bbl.; Tilbury and Romney 77,280 bbl.; Bothwell 1,136 bbl.; Leamington 3,405 bbl., and Dutton 4,230 bbl.

The average price for Petrolea crude during the year was about $1.33½ per bbl. It opened in January at $1.44 per bbl., at which figure it remained until May 4th, when it dropped to $1.39. On May 11th it fell again to $1.34, on June 25th to $1.29, on July 16th to $1.26, and on October 21st to $1.24, at which it closed the year. The price of Tilbury crude is on a parity with that of Petrolea, but freight by rail to Sarnia from the shipping points must be allowed for. At the beginning of the year the price at Tilbury was $1.27 per bbl. It dropped on May 4th to $1.22, on May 11th to $1.17, on June 25th to $1.12, on July 16th to $1.09, and on October 21st to $1.07, at which figure it remained until the end of the year. The average for Tilbury oil for the twelve months was perhaps $1.16 per bbl. These prices are irrespective of the Dominion Government

The refineries, of which there are two in Ontario, the Imperial Oil Company's at Sarnia, and the Canadian Oil Companies' at Petrolea, distilled a total of 35,530,918 gallons of crude last year. Of this, 16,015,527 gallons, or 45 per cent., was domestic, and 19,515,391 gallons imported.

The following statistics covering five years ending with 1909 show the quantity of crude oil distilled annually and the quantities and value of the several products. It will be seen how the production of domestic crude has steadily gone down during the period covered by the table with the exception of 1907, the first full year for the Tilbury-Romney field:—

Table XIII.—Petroleum and Petroleum Products, 1905 to 1909

Schedule.		1905.	1906.	1907.	1908.	1909.
Crude produced	Imp. gal.	22,131,658	19,928,329	27,621,851	18,479,547	14,723,105
Crude distilled	"	33,821,998	36,134,349	34,961,706	34,675,120	35,530,918
Value crude produced	$	898,545	761,546	1,049,631	703,773	559,478
Value distilled products	"	2,196,678	2,506,177	2,568,464	2,347,680	2,501,384
Illuminating oil	Imp. gal.	16,433,588	16,125,450	18,319,232	17,604,920	17,902,254
Lubricating oil	"	3,402,977	4,351,818	3,931,767	3,384,940	3,856,778
Benzine and naphtha	"	2,827,971	3,497,954	4,132,239	3,667,997	3,930,691
Gas and fuel oils and tar	"	5,788,351	5,961,834	5,632,608	4,461,186	4,687,588
Paraffin wax and candles	lb.	4,077,610	5,011,467	5,132,394	5,400,003	7,092,278
Workmen employed	No.	469	496	435	430	436
Wages paid	$	280,701	308,986	265,316	247,829	261,014

Natural Gas

The production of natural gas has much increased of late years. In value it amounted in 1909 to $1,188,179, an increase over the yield of 1908 of $199,563, and being the largest output yet recorded. For the last four years the quantity produced has been as follows: In 1906, 2,534,200 thousand cubic feet; in 1907, 4,155,900 thousand; in 1908, 4,483,000 thousand; and in 1909 (say) 5,388,000 thousand cubic feet.

The output comes from three fields, namely: Welland county, Haldimand and Norfolk counties, and the counties of Essex and Kent. The Haldimand-Norfolk field is the largest producer. The people of these districts, and of the cities, towns and villages outside of the actual gas area to which it is piped, enjoy a great boon in the use of natural gas for fuel purposes. It is an ideal fuel. It is cleanly, leaving no ashes and producing no smoke; it can be turned on when wanted and turned off when its work is done, thus eliminating waste entirely to the careful user; and it is much cheaper than either coal or wood. The possession of natural gas is an important advantage for the householder as well as to the manufacturer, though it seems a pity that a fuel so suitable for domestic use could not be preserved for that purpose only; and as the quantity, no matter how large it may be, is in any field limited, it is naturally an object of prime importance to the people in that field to conserve the supply to the utmost. To assist in doing so, the Legislature in 1908 passed an Act to Prevent the Wasting of Natural Gas and to Provide for the Plugging of all Abandoned Wells (7 Edward VII., chapter 47), by which power was conferred upon inspectors appointed under the Act to enforce the stoppage of waste. The Supplementary Revenue Act, 1907, also contained provisions which were even more effective than those of the above mentioned Act, and the enforcement of these laws has reduced the waste of gas to a minimum. Probably not less than 200,000 people in Ontario are now using natural gas, and extensions of pipe systems, etc., are now in progress, which will result in a large increase in this number. From the Haldimand-Norfolk field gas is piped to Hamilton, Dundas, Galt, Brantford and other places; the Welland field supplies St. Catharines, Niagara Falls, Bridgeburg and other towns and villages; and from the Kent-Essex field people in Chatham, Leamington, Blenheim and elsewhere are supplied. Franchises have been obtained by the Volcanic Gas and Oil Company from the city of Windsor and the towns of Walkerville and Sandwich, and gas is to be delivered in these places from the Kent field by 1st December, 1910.

The principal gas-producing concerns are the following: In Welland, Provincial Natural Gas and Fuel Company, Buffalo, N.Y.; United Gas Companies, St. Catharines; Port Colborne-Welland Natural Gas and Oil Company, Port Colborne; Welland County Lime Works, Port Colborne; Bertie Natural Gas Company, Ridgeway; Ontario Iron and Steel Company, Welland; Sterling Natural Gas Company, Port Colborne; Empire Limestone Company, Buffalo, N.Y.; Industrial Natural Gas Company, Welland; in the Haldimand-Norfolk field, Dominion Natural Gas Company, Pittsburg, Penn.; Producers' Natural Gas Company, Hamilton; Norfolk Gas Company, Port Dover; Selkirk Gas and Oil Company, Selkirk; Dunnville Gas Development Company, Dunnville; and in the Essex-Kent field, Volcanic Oil and Gas Company, Niagara Falls; Beaver Gas and Oil Company, Leamington; Maple City Oil and Gas Company, Chatham; and Leamington Oil Company, Detroit, Mich.

The Essex-Kent and Haldimand-Norfolk gas fields are proven to the edge of Lake Erie in both cases, and a natural inference was that the gas-bearing territory would be found to extend under the waters of that lake. A number of leases have been granted by the Crown authorizing the sinking of wells for gas and oil on parts of the lake bed in front of Rainham, Walpole, Charlotteville, Romney, Tilbury East and Woodhouse townships. Good wells have been found on several of these leases and a corresponding addition has been made to the gas-yielding area.

Messrs. John Scott of Petrolea and Donald A. Sharpe of Welland are inspectors of oil and gas wells under the provisions of 7 Edward VII., chapter 47. The latter was appointed in succession to Mr. John Toyne, who resigned towards the close of the year. Mr. Scott's duties are in Lambton, Essex and Kent counties, while Mr. Sharpe looks after the counties of Haldimand, Norfolk and Welland.

Mr. Scott reports that 546 oil wells were abandoned and plugged, and that there are 518 wells which require to be bailed. The latter call for a good deal of attention, as it is necessary to test the casing frequently, and if any are found leaking fresh water they are abandoned and plugged. Some 129 wells are not being operated, which will require plugging if pumping operations are not begun. There is little trouble with gas wells or lines.

Mr. Toyne reports that much of his time was occupied in looking after the gas wells being sunk on the shore of Lake Erie in order to see that they were properly protected from the effect of rough weather and ice, which might possibly lead to the introduction of water into the gas-bearing strata. There is no oil in this field, and the complications which occasionally follow the presence of both in the same wells were therefore absent.

Mr. G. R. Mickle, M.E., in the performance of his duties as Mine Assessor, has charge of the collection of the tax on natural gas and also the direction of the movements of the gas and oil well inspectors. Under the heading of Mining Revenue, Mr. Mickle makes some interesting remarks regarding gas and oil.

Minor Products

In the varied list of mineral products of Ontario are a number of substances useful in the arts, which though not produced in large quantity, are yet the basis of industries of some importance, most of which could be greatly extended if necessary. These are enumerated below.

Calcium Carbide

Calcium carbide is made by two companies, the Willson Carbide Company, Merritton, and the Ottawa Carbide Company, Ottawa. Together they produced 2,349 tons in 1909 as compared with 2,364 tons in 1908. The principal use of calcium carbide is, of course, the production of acetylene gas for illumination purposes, for which it finds considerable employment in small or isolated places where ordinary lighting gas is not available.

Corundum

The production of corundum, which had been discontinued by the largest operating company in 1908, was resumed last year, and 1,508 tons of this mineral, crushed and graded to size, were turned out during the twelve months. The Manufacturers' Corundum Company, lessees of the works of the Canada Corundum Company, Craigmont, and the Ashland Emery and Corundum Company, Burgess Mines, were the producers.

The chief employment of corundum continues to be for abrasive purposes, for which it is eminently suitable, though in certain special uses it has to compete with such substances as carborundum, an artificial compound made by fusing silica and carbon in the electric furnace, also with garnets, etc. Notwithstanding its high contents of aluminium, no feasible method has yet been brought forward of reducing this metal from corundum.

Feldspar

The business of producing feldspar was not very brisk last year, the demand being somewhat inactive. The quantity produced, however, was 11,001 tons as against 7,875 tons in 1908. Prices remained at about the same level. The production came entirely from the quarries in the neighborhood of Verona station on the Kingston and Pembroke railway, Frontenac county, operated by the Kingston Feldspar and Mining Company and the McDonald Feldspar Company. The latter is a newcomer into the field, the president being Mr. R. R. Gamey, M.P.P.

The product is shipped entirely to the United States, where it is used in the manufacture of porcelain goods and enamelled ware. The superior qualities of the Ontario feldspar enable it to compete with the product of the United States quarries, and to obtain a price which will pay for the long haul to the potteries of Newark, N.J., and East Liverpool, Ohio. So far the attempts made to export feldspar to England have not been successful, ocean freights being so uncertain as to make it difficult to quote prices delivered.

Graphite

Two deposits of graphite were worked last year, one by the Black Donald Graphite Company on Whitefish lake, fourteen miles from Calabogie, Renfrew county, and the other by the Globe Refining Company in the township of North Elmsley, in the county of Lanark. At both mines there are works for treating the graphite, the output of both plants being 730 tons of the refined product, valued at $37,624. At the Black Donald property mining is carried on for about three months in the year only, but the mill is kept in operation all the time. None of the crude product is marketed as such, refined graphite only being shipped and sold to the trade.

Mr. B. F. Bunting, general manager of the Black Donald Company, states that of the output of the mill about 25 per cent. consists of crystalline flake graphite, while the other three-fourths comprise various grades of what are termed "powdered plumbago." No. 1 flake is used for lubricating purposes, and also in the manufacture of crucibles, while Nos. 2 and 3 flakes are employed principally for the lubrication of high-speed engines. Of the powdered plumbagos the lower grades are used for foundry facings, etc.; the better qualities for stove polish, electrotyping, graphite structural iron paint, and many other purposes. The bulk of the company's output is marketed in the United States, the Canadian demand being limited. European shipments have been tried, but the time consumed in making delivery and red tape in forwarding consignments make the business somewhat unsatisfactory. The mill is operated by electricity generated at the Madawaska river, two miles away, each department of the mill being operated by an individual motor. Some prejudices against Canadian graphite product have had to be met by the company among United States consumers, due to inferior and badly-prepared goods having previously been thrown upon that market, but this difficulty is now disappearing. Mr. Bunting adds that the refining of graphite has baffled many experimenters both in this country and in the United States, and that successful refiners guard their processes carefully as trade secrets.

Gypsum

The production of gypsum is confined to the valley of the Grand river in the neighborhood of Paris, Caledonia and Cayuga, where deposits occur in the Onondaga limestone. The Alabastine Company of Paris and the Imperial Plaster Company of Toronto were the only producers, raising and shipping some 11,488 tons of crude gypsum. By the former company the raw material is worked up into a variety of products, including alabastine, wall plaster, bug poisons, etc.; and by the latter it is used, along with wood fibre, to produce an article called by the latter name, and used for construction purposes.

Peat Fuel

Peat fuel was made to the extent of about 60 tons by J. McWilliam, M.D., at a plant in the township of North Dorchester, Middlesex county. Dr. McWilliam reports: "We spent the whole season putting in new machinery and collected 600 tons of dust, but only pressed about 60 tons, when the frost got too much for us."

High hopes have at various times been entertained of a successful solution of the problems presented by the manufacture of an acceptable fuel from peat, and many promising attempts have been made to realize these hopes. The crux of the question undoubtedly lies in the removal of the moisture, of the retention of which peat is ex-

tremely tenacious. If artificial heat must be resorted to for this purpose, the cost is usually raised to a point at which the resulting fuel is unable to compete with coal, regard being had to the calorific value of each. Probably the most hopeful method of utilizing the fuel value of peat is by the producer gas process, but this puts it out of the field of domestic fuels, and restricts its employment to manufacturing or industrial plants which can be located near the bog from which the peat is taken. An immense quantity of carbon is lying dormant in the peat bogs of Ontario, and there is little doubt that some day an efficient fuel will be produced from them. It may not be, however, until coal and wood are higher in price than they now are.

Apatite

Phosphate of lime, or apatite, was mined in Ontario and Quebec in considerable quantities a good many years ago, but the lower grade and cheaper phosphates of the Southern States drove it from the market, and it has not since found a re-entrance in any quantity. In 1908 some 881 tons were reported as mined in Ontario, but last year the production fell to 272 tons. It is not improbable, however, that Canadian phosphate may come again into demand. It is frequently found in conjunction with deposits of mica.

Talc

A promising industry has been established at Madoc by Messrs. George H. Gillespie and Company in the grinding and preparation of talc for the market. Several grades of product are turned out, differing in fineness, and adapted to a variety of uses, such as the manufacture of cosmetics and soaps, paper filling, leather dressing, etc. The raw material, which is of fine quality, is obtained from a deposit in the township of Huntingdon, Hastings county, some 4,350 tons having been raised last year.

Quartz

The output of quartz last year amounted to 63,172 tons, valued at $75,329, as against 44,741 tons, worth $52,830, in 1908. The principal production was by the Canada Copper Company and the Mond Nickel Company for furnace linings. A considerable quantity was also raised by the Lake Superior Power Company, and by the companies mining feldspar in Frontenac county. In quarrying the feldspar, dikes of quartz are encountered, which are broken up and removed, the material being kept separate from the spar.

A Glass Sand Area at Amherstburg

Rev. Thomas Nattress, B.A., of Amherstburg, Ont., who has already contributed to the Bureau much useful information regarding the geology of the stratified rocks of Essex county,[5] gives the following description of an outcrop of Sylvania sand-rock at Amherstburg. Glass manufacturers and others who are interested in a supply of nearly pure silica free from discoloring agents might with profit investigate this occurrence.

In the bed of Detroit river, at Amherstburg, Ontario, immediately on the south side of the town, there is a surface extension of Sylvania sand-rock the full breadth of the channel between Bois Blanc island and the main shore of Essex county.

On the south end of Bois Blanc it pumps up with the water in one or two wells put down by the Detroit, Belle Isle and Windsor Ferry Company on their park property.

Ashore, in the Dr. Green shaft on the Point Farm on Elliott's Point, it lies under 25 feet of Silurian dolomite, and has there been tested by the drill to a depth of seven feet. A hundred yards east of this a deeper test was made by the late Mr. Fred Elliott to a depth of 14 feet without penetrating the deposit. In rear of the next farm south of the Point Farm the sand is 84 feet in depth (Brumell) under 228 feet of rock. At the rear of the third farm north of the Point Farm there is 60 feet of it under 252 feet of other rock (Brumell).

These farms are in Malden township. In the adjoining township of Anderdon, some seven or eight miles north-east from the Dr. Green shaft at Elliott's Point, there is a depth of 30 feet of Sylvania sand-rock under 350 of limestones and dolomites.

In No. 11 C.P.R. salt well at Windsor there is 55 feet of it under 535 feet of dolomites and limestones.

[5] 11th Rep. Bur. Min., 1902, pp. 123-7; ditto, 1904, Part II., pp. 41, 42.

Across the river from here, at the salt shaft at South Detroit, there is a depth of 117 feet of it under 63 feet of Dundee (Corniferous), 189 feet of Lucas dolomite, 38 feet of problematical limestone, and 47 feet of Flat Rock dolomite.

At Wyandotte there are 60 feet of Sylvania under 50 feet of Dundee (Corniferous) and 105 feet of dolomite.

And in the extreme south-east corner of Wayne County, Michigan, immediately opposite Elliott's Point, there is an outcrop of it. Thence the deposit extends across Monroe County into north-western Ohio, past the village of Sylvania, whence it is named.

The Sylvania is a pure glass sand. It has been variously described in equivalent terms as 99 per cent. silica,[6] minute loosely cohering grains of quartz,[7] etc. It is altogether free of iron, except where an oxydized surface has been exposed to the effect of some piece of iron ore from the cargo of a passing steamer.

Sylvania sand-rock has been thought by several authorities to be the equivalent of the Oriskany sandstone of New York State. It has, however, a lower and altogether independent horizon, equivalent as it may be in quality, properties and utility. There is sufficient local evidence, on both sides of Detroit river, to enable identification of the Oriskany at the base of the Corniferous—where it has always been stated by New York geologists to belong; whereas the Sylvania lies deeper than upper Silurian beds, which are characterized by "gypsum, and most of the strontianite and celestite"[8] of the dolomite beds.

In addition to its use as a glass sand of tested utility, found to be of excellent quality for that use even where (as in Monroe County river-bottom and river-bank exposure), it requires to be washed, the Sylvania, like the Oriskany, is available for use in the manufacture of cleansing compounds. Also, as at the Buffalo pottery, in the packing of pottery for firing.

Experiment has been made locally in the use of the sand in the manufacture of artificial stone. Alone, however, it is too sharp a sand for this purpose. To avoid the excessive use of cement, and thus preserve the desired whiteness in the finished product, it would be necessary to combine marble dust, etc., with the sand.

The most accessible part of the deposit is the river bottom at Amherstburg and the shaft at Elliott's Point.

The same sand has been extensively imported into Ontario for glass purposes.

It remains but to say that the irregular, loop-shaped contour of the Sylvania in the Detroit river area is accounted for by observing that the Cincinnati anticline extends considerably farther north than hitherto mapped by Schuchart, or described by Ohio or Michigan geologists.

Mining Revenue

Receipts from mining sources for the ten months ending 31st October, 1909 (the fiscal year having been changed), amounted to $979,464.15, made up as below. For the calendar year 1908 the receipts were $549,178.94.

1. On account of mining land sales	$235,098 04
2. do do do leases	19,016 74
3. Miner's licenses, permits and fees	219,473 95
4. Mining royalties	338,426 66
5. Supplementary Revenue Act	49,730 03
6. Provincial mine (including sale of)	115,411 71
7. Diamond drills	1,517 42
8. Provincial Assay Office	789 60
Total	$974,464 15

The following explanations are made with regard to the several items of receipts, with the view of making clear the working of the law in the obtaining of a revenue from the mining lands of the Crown.

Mining Lands

Details of mining lands disposed of during the ten months are given in the following table, which has reference to the transactions carried out during the period, but is not confined to moneys actually received within the ten months. The totals for Sales and Leases, therefore, do not agree with the figures given above, which include the sums received at the Department between 1st January and 31st October, and nothing else. In the case of mining leases, much rental paid on previously issued leases is comprised.

[6] Solvay Process Company, South Detroit. [7] Geological Survey, Ottawa.
[8] Sherzer, in 1899 Michigan Geological Survey, on Monroe County.

Table XIV.—Mining Lands Sold and Leased in 10 Months Ending 31st October, 1909

District.	Sales.			Leases.			Total.		
	No.	Acres.	Amount.	No.	Acres.	Amount.	No.	Acres.	Amount.
			$ c.			$ c.			$ c.
Nipissing	286	8,659.41	358,408 69	50	2,511.03	2,511 03	336	11,170.44	360,919 72
Thunder Bay	3	240.00	660 00				3	240.00	660 00
Sudbury	4	146.75	440 31	2	709.61	709 61	6	856.36	1,149 92
Algoma	5	1,309.06	3,471 53	1	75.00	75 00	6	1,384.06	3,346 53
Kenora	5	144.10	360 25				5	144.10	360 25
Rainy River	3	120.00	360 00				3	120.00	360 00
Elsewhere	4	90.00	135 00				4	90.00	135 00
Total	310	10,709.32	363,635 78	53	3,295.64	3,295 64	363	14,004 96	366,931 42

The mining leases that are now being issued are mainly for lands in the Temagami Forest Reserve, in which part of the Elk Lake silver camp and the whole of the Gowganda region are situated. The Mining Act forbids the sale of lands for mining purposes in a forest reserve, the idea, no doubt, being that when the leases fall in, as many of them probably will should the lands prove unremunerative in working, the Crown will again be in control of the territory and can use it for the growing of timber. A few leases are still being granted on old applications under the Act of 1897.

It will be observed that the lands disposed of were practically confined to the district of Nipissing, in which are situated the silver fields of Cobalt, South Lorrain and Gowganda. The acreage sold or leased in other parts of the Province was not greater than usual.

The Gillies Limit

Sales are a much heavier item than in 1908. This is accounted for by the fact that a small portion of the tract known as the Gillies Limit was subdivided into parcels of convenient size and sold by public tender. Details of the several sales are given below.

The Gillies Timber Limit lies on both sides of the Montreal river and covers an area of 100 square miles, being approximately 10 miles square. Its southeastern boundary comes to about 10½ miles from the mouth of the river, to the course of which and also of the western shore of lake Temiskaming, the limit extends in a parallel direction upstream. The situation of the Gillies Limit is indeed dependent upon the position of the shore of the lake, being laid out with its northeastern boundary five miles distant from the lake. Lumbering operations have been carried on in the limit for many years, in fact more or less continuously ever since the right to cut the timber was bought from the Crown in 1852, and a good deal of the pine has been removed. Nevertheless, parts of the berth have never been cut over, and there is still standing not only considerable green pine but also large quantities of cedar, spruce, jack-pine and the other varieties of timber characteristic of the northerly forests of the Province. The existence of a valuable tract of virgin pine in the extreme northeastern angle of the limit, within two or three miles of the present town of Cobalt, and the fear that it might be endangered by fire, led to the land being withheld from staking out for minerals when the discovery of the rich silver veins from the Cobalt camp were attracting hundreds of prospectors to the neighborhood. Later, the Government decided to prospect the area for minerals with the view of utilizing the deposits, if any should be found, to the best advantage for the public.

Accordingly, the Legislature having appropriated the necessary funds, the exploration of the limit was begun by the Bureau of Mines in the spring of 1906, Professor W. G. Miller, Provincial Geologist, being in charge of the work. There were rumors regarding the fabulous wealth of the Gillies Limit, and circumstantial reports were current of veins having been found of a size and richness to out-Cobalt Cobalt. Rewards were offered for the disclosure of such finds, and much time and labor was con-

sumed in endeavoring to locate the veins on the ground when the alleged discoverers could be induced to support their tales by heading a search party. Not an atom of truth was found to exist in any of the "discoveries," and the only veins found upon the limit were those disclosed by the labors of the Government prospectors.

Naturally, the area nearest the known deposits of the Cobalt camp was first examined. In 1906 between three and four miles of trenches were dug, bed rock being covered in many places with gravel and boulders from one to five or six feet thick. Several veins were found, the most promising being one exposed while trenching by two prospectors named Brown and McLaren in the Government's employ. A standing reward of $150 per inch in width for valuable silver-bearing veins served to stimulate the vigilance and exertions of the trenchers, and as the vein was seven inches wide at the surface, Brown and McLaren divided between them a bonus of $1,050. Upon this vein it was determined to sink, and the opening came to be called the Provincial mine. A shaft was sunk to a depth of 140 feet, and levels run at 65 feet and 125 feet, at the first level drifts being driven east 350 feet and west 250 feet respectively. In 1908 another shaft was put down near the eastern boundary of the property to a depth of 70 feet, and in 1909 a diamond drill was employed to test the vein. Neither here nor in the main shaft, however, was any large body of rich ore located. Several other veins were found, one near the T. & N.O. railway track opposite the Morrison or Red Jacket claim, and one or two in the vicinity of Giroux lake, but silver in paying quantity did not appear to be present in any. The whole of the area comprised within the limit was examined in a general way, but nothing further was observed which appeared to warrant trenching or sinking. The geology of the whole was, however, carefully worked out, and the tract surveyed into blocks containing 640 acres each, for convenience in any future operations.

Four sales were held in all, namely, on 15th June, 13th July, 13th September and 15th November, 1909, after due advertisement by circular and in the newspapers. At the first sale 11 parcels containing 213.99 acres were sold for $47,085; at the second, 13 parcels containing 208.54 acres for $49,211.50; at the third, 20 parcels or 448.90 acres for $127,082.50; and at the fourth, 37 parcels or 870 acres, for $488,079.60; in all, 81 parcels containing 1,671.71 acres for $711,458.30. The last sale took place after the expiry of the ten months' fiscal period, and consequently only the amounts paid in connection with the first three sales are included in the receipts given above. The conditions of sale provided for an expenditure of $20 per acre per annum for seven years in stripping or opening up mines, sinking shafts, or other actual mining operations, not including the construction of houses, roads, or other like improvements. A royalty of ten per cent. was also reserved to the Crown on the gross proceeds (less freight and smelter charges) of all ores, metals and minerals taken from any of the lands, so that if workable deposits are found, a reasonable share of the profits will be obtained for the public benefit.

It will be noted that the prices obtained at the last sale were much better than at either of the first three; this is no doubt due to the fact that on parcel A. 22, purchased by Mr. J. H. Waldman of Montreal at the first sale, a vein was found after vigorous trenching which showed native silver, and which was traced across the boundary of the location to parcel A 23, bought by Mr. G. E. Martel of Renfrew. This vein shows much similarity to that upon which the shaft at the Provincial mine was sunk.

Miners' Licenses, Permits and Fees

The receipts from the sale of miners' licenses, permits for prospecting in the Temagami Forest Reserve, and fees for recording claims, transfers, etc., were much in excess of those for the year 1908, being $219,473.95, as against $137,730.20. The charge for a miner's license, which is required in order to stake out mining claims on Crown lands, is $5 for an individual; for an incorporated company the fee varies according to the amount of the capital stock, being $25 for a capital not exceeding $40,000; $50 for a capital over $40,000, but not exceeding $100,000; $75 for a capital over $100,000, but

not exceeding $500,000; $100 for a capital over $500,000, but not exceeding $1,000,000; and for each additional $1,000,000 or fraction thereof $100. All licenses expire on the 31st day of March next after the date of issue, and if any unpatented mining claim depends upon the validity of a license, it must be renewed on expiry. Licenses issued after the first day of October are charged for at half rate.

The demand for miners' licenses naturally varies with the activity in prospecting for minerals, and this in turn depends to a large extent upon the discovery of new mineral fields and rich deposits. There has been a succession of such discoveries during the last few years. The finds at Cobalt beginning in 1903 and extending throughout 1904, 1905 and 1906 were so extraordinary that a large army of prospectors was attracted to the field, and these were followed by the striking of rich silver ores on the banks of the Montreal river, in South Lorrain and Gowganda. The nickel field in Dundonald and Clergue was located during 1908, and even restricted, as it apparently is, the possibility of another Copper Cliff or Creighton mine being hidden under the drift of that locality is sufficient to draw prospectors into the district. Then in 1909 the "gold dome" and other gold-besprinkled quartz shows at Porcupine lake turned the attention of hundreds of prospectors to this newest of Ontario camps. Still later, a rush was precipitated while the snow was yet on the ground by a rumor that the Porcupine finds had been equalled or excelled by discoveries at Caribou, or Camel's Back lake, situated west of the T. & N.O. railway on the Wataybeeg route. A considerable number of prospectors were attracted to the spot, many of them being taken by special train to Burk's Siding, only to find that the report was a hoax. There is so much unexplored territory in Northern Ontario, and so large a part of it is occupied with rock formations favorable to the occurrence of minerals, that further discoveries will inevitably be made, and the prospector kept busy for many years to come.

The fee for a permit to search for minerals in a forest reserve is $10, the permit being for twelve months. The presence of a large number of prospectors in a coniferous forest beyond doubt constitutes a danger to the safety of the trees through the introduction of fire. It is necessary, therefore, during the dry season of the year to maintain a large force of fire rangers to prevent, if possible, the occurrence of fires, and to assist in their extinguishment, should fires occur. The expense of maintaining this fire patrol is much greater than the revenue derived from the issue of Forest Reserve permits.

Mining Royalties

There was received during the ten months from mining royalties the sum of $338,426.66, as follows:—

Crown Reserve Mining Company	$145,437 46
O'Brien Mine	141,497 15
Temiscaming and Hudson Bay Mining Company	44,403 26
Chambers-Ferland Mining Company	7,088 79
Total	$338,426 66

The Crown Reserve pays a royalty of 10 per cent. of the value of the ore at the pit's mouth, this being one of the conditions of purchase from the Crown. The O'Brien mine contributes on a basis equal to 25 per cent. of the receipts from sales of ore, less a proportion of surface expenses, and there is a similar arrangement with the Chambers-Ferland Company. The Temiskaming and Hudson Bay Company pay at the rate of 15 per cent. of the net receipts.

The accruals on account of royalty for the calendar year 1909 were as follows:

Crown Reserve Mining Company	$160,437 46
O'Brien Mine	141,497 15
Temiscaming and Hudson Bay Mining Company	52,263 62
Chambers-Ferland Mining Company	16,259 64
Total	$370,457 87

Of this amount only $338,426.66 fell due and was paid within the fiscal period.

Up to 31st October, 1909, there had been received by the Department in mining royalties an aggregate of $779,443.68, as follows:

O'Brien Mine	$474,357 52
Crown Reserve Mining Company	174,695 31
Temiscaming and Hudson Bay Mining Company	123,302 06
Chambers-Ferland Mining Company	7,088 79
Total	$779,443 68

In the case of sales of land on the Gillies Limit, a condition of the grant is the payment of a royalty of 10 per cent. on the returns from the ores extracted. No shipments were made in 1909 from any of the locations on the limit.

Supplementary Revenue Act 1907

The receipts derived under the provisions of the Supplementary Revenue Act, 1907, during the ten months ending with October last, were $49,730.03, made up as follows:—

Profit tax	$28,812 60
Acreage tax	10,719 85
Gas tax	10,197 58
Total	$49,730 03

Owing to the change in the fiscal period the receipts falling within the ten months are much less than they were for the calendar year 1908, the taxes imposed by the Act not being payable until the first day of October.

Mr. G. R. Mickle, M.E., Mine Assessor, who is charged with the duty of ascertaining the amount due as taxes under this Act and collecting the same, supplies the following information regarding the working of the law for the year 1909. It will be observed that Mr. Mickle's figures are for the full calendar year, not for the ten months' period only.

This Act imposes three taxes, viz.: (1) Profit tax, being a levy of three per cent. annually on all profits of mines in excess of $10,000.00. The method of arriving at the profits is set out in full in the Act, certain deductions being made for income tax paid the municipality in which the mine is situated. (2) An acreage tax of two cents on all lands patented or leased as mining lands which are in territory having no municipal organization. (3) Natural gas tax of two cents per thousand cubic feet, 90 per cent. of this being rebated if the gas is used in Canada.

The results for 1909 were as given below. The amounts due under this Act are not payable till October 1st, and it has been found impracticable to collect all payments before the 31st of October (the end of the fiscal year of the Province at the present time). The statement given here, therefore, does not agree with that which takes into account only payments made within the fiscal year.

The total amount received as taxes due for the year 1909 was $101,951.49, distributed as follows:—

(1) Profit tax	$78,327 58
(2) Acreage tax (15th April, 1909, to 15th April, 1910)	10,777 55
(3) Natural gas tax	12,846 36
Total	$101,951 49

The acreage tax is paid at all times throughout the year, sometimes several years' tax being paid at once. No effort has been made to keep the tax belonging to any year separate. The amount given shows the payments made during the period. It will include most of the 1909 tax.

With regard to the first, the profit tax, this was received from fifteen different companies, most of which are in the Cobalt district. Those companies which pay a royalty under separate agreements with the Crown are not required to pay the profit tax, and this reduces the amount accruing under the tax considerably. The amount would be greater by about $26,800 if those companies paying a royalty had been on the same basis as the others.

Outside of Cobalt, two companies operating nickel-copper mines in Sudbury district paid a profit tax, and also one company producing iron ore. If the iron ore is treated

in domestic furnaces the tax is remitted. As the price paid for iron ore in Canada during 1908 (the year on which the tax is based) was good and the demand brisk, very little ore was exported, and the tax dropped to a small amount.

No reason is visible for anticipating any substantial change in the revenue from this source during the next two or three years; probably some revenue will be derived from pyrites mines. It is too soon to say whether any considerable revenue may be expected from gold mines.

The operation of the acreage tax was explained fully in last year's report. Briefly stated, about 800,000 acres in the Province are liable for this levy, the greater part of this being situated in the northwestern part of Ontario, where the land was taken up in large blocks, many containing 400 acres and some 6,400 acres. In the northeastern part of the Province, which is younger so far as mining or the acquiring of mining lands is concerned, most of the land has been staked under the Act of 1906; 40 acres is therefore the maximum, and it is not necessary to purchase till three years and six months after staking, provided the work prescribed is done. The number of acres patented, and consequently taxable, is small in this part, considering the activity in mining, only some 14,000 acres of land subject to the tax existing in the whole Nipissing district, extending from the eastern boundary of the Province westward nearly to Sudbury.

As required by the Act, notice was published of all lands two years in arrears for taxes and the time for forfeiture fixed as 30th June, 1910. About 247,000 acres in all are thus in arrears and were advertised in December last; taxes have been paid on 20,200 acres up to date (15th April, 1910). It seems probable that before the time in which payment may be made elapses, the number of acres in arrears will be reduced to less than 200,000.

The natural gas tax was paid by thirty-two different individuals or companies operating in the three fields, viz.: the Welland-Haldimand-Norfolk field, the Kent field south of Chatham, and smaller Essex field. Of the amount paid about 36 per cent. was tax on gas exported or wasted. In the first mentioned field, in which a comparatively thin bed of gas-bearing rock is spread over an area which it is hard to estimate, extending from east to west along the shore of Lake Erie, producing wells are found for a distance of about 60 miles, not continuously, however. Extensions to the west may be found. The extent of the field in a north and south direction is difficult to determine. Undoubtedly it runs under the lake and dies off toward the north, probably three to four miles from the lake shore northwards being the limit. The area would, therefore, be something like 200 square miles, excluding the part covered by the lake. The results of drilling on the leases of the bed of the lake obtained from the Crown have been satisfactory to the operators.

No oil has ever been found in this area and the gas has been well conserved from the start. On 1st April, 1909, exportation of gas from this field ceased entirely. The operation of the Supplementary Revenue Act contributed largely to this result.

In the Kent field the area of gas-bearing rock is smaller, being about 34 square miles. The thickness, however, is greater, so that it forms a very valuable field. Oil is also found in that locality, some even existing in the gas area proper, the gas field being flanked by an oil territory. This has led to a conflict of interests, some of the operators for oil being indifferent to waste of gas. Under the Act gas wasted was taxed at the full rate of two cents per thousand cubic feet. This was sufficient to compel the stoppage of all waste, and to protect the revenue derived from natural gas tax. The Legislature, however, in the session of 1910 passed an amendment whereby waste from a well producing oil in "paying quantities" cannot be taxed except under certain circumstances. This amendment will diminish the revenue derived from gas. The future will show whether there are any substantial compensating advantages from the results of the oil operations in that area.

Provincial Mine

The receipts under this head, $115,411.71, represent the price ($113,111) obtained on the sale of the mine and a few small sums received for rental of power supplied to neighboring properties.

The Provincial mine, consisting of about 30 acres, was put up at tender and disposed of along with other parcels on the Gillies Limit offered on 15th October, 1909. A considerable amount of money had been expended in working the property and in equipping it with machinery. The vein upon which the main shaft was sunk, though showing much native silver at the surface, did not prove persistent or rich in depth, and the

Department had the alternative of spending a further sum, probably a large one, in the endeavor to find payable ore, or of offering the property for sale and permitting private enterprise to supply the capital for the test and reap the benefit should it be successful. After duly weighing the question, the conclusion was reached that it was not wise to risk more of the Province's money in the attempt, but that it was better to sell. It was one thing to work a rich deposit of ascertained value, and quite another thing to adventure the funds of the Province, with results which might be satisfactory or might be unsatisfactory—even such chances as a private company risking its own capital might deem itself in every way justified in taking. In short, while quite willing to work the mine for the benefit of the Treasury, if it had turned out to be a bonanza similar to some of the well-known Cobalt mines farther north, the Department did not deem it desirable to speculate with the Province's funds, notwithstanding the fact that the Legislature had placed them at its disposal.

It may be added that the purchase money not only repaid the Province for all the money spent on the mine proper, but also for all the expenditure in surveying and exploring the limit as a whole. Should the Provincial mine prove profitable to its new owners, ten per cent. of the returns will accrue as royalty for the benefit of the public chest.

Diamond Drills

Receipts for rental of the Government diamond drills amounted to $1,517.42. The first of the drills procured by the Department was bought in 1894, and subsequently, in 1900, another smaller one was purchased. Under the terms of the regulations adopted, the drills were loaned to persons wishing to prospect their properties by boring, the Government bearing 35 per cent. of the cost, and the person getting the drill the remainder. A large amount of useful work was done by the drills, but after so long service the parts had become worn, and the machines required extensive repairs or replacement by new ones altogether. In addition, the reason for the Government obtaining the drills and placing them at the service of the public no longer existed in its original force. When they were bought diamond drills were scarce, and it was difficult, if not impossible, for the owner of a mineral prospect who did not himself own a drilling outfit to procure the services of one. Now, however, not only are the mining companies, whose number has greatly increased, provided with as many drills as they deem necessary for their own use, but private contractors stand ready to supply drilling plants and to put down holes, generally at a specified price per foot. Under these circumstances, the Department decided not to renew the drills or continue in the business, and both plants were disposed of, together with the diamonds on hand.

Assay Office

The receipts from the Belleville Assay Office for the ten months, $789.60, are composed of fees received for assays and analyses made for prospectors and others sending samples for examination. The Assay Office also does a large amount of work for the Bureau, and in sampling and assaying shipments of ore on which royalty is payable to the Crown.

Profile

Accompanying the Nineteenth Report will be found a profile of the region from Toronto northerly to the edge of the Paleozoic limestones on the Hudson Bay slope. The profile follows the lines of the Grand Trunk and the Temiskaming and Northern Ontario railways to Cochrane, a distance of 479 miles, thence westerly 32 miles along the National Transcontinental railway to the Mattagami river, which watercourse it descends a distance of about 80 miles. Outliers or isolated areas of Paleozoic limestones occur at lake Nipissing and the town of New Liskeard at the head of lake Temiskaming. The profile shows that these uneroded patches of limestone lie in comparatively deep depressions or valleys of the pre-Cambrian rocks.

Mining Companies Incorporated in 1909

There were 282 mining companies incorporated under the laws of Ontario in 1909, with an aggregate nominal capital of $236,883,000. The record in this respect for the year is intermediate between that of 1908 and that of 1907. Last year the number of companies was 184, having a combined capital of $123,526,500, while in 1907 the number was 321 and the authorized capital $319,876,000.

Last year nine companies of Dominion or foreign incorporation were licensed to carry on business in the Province, as against eight in 1908.

Following is the list:—

Table XV

Name of Company.	Head Office.	Date of Incorporation.	Capital Stock.
			$
Alumni Mines Company, Limited	Ottawa	April 7	1,000,000
Arcadia Silver Mining Company, Limited	Morrisburg	August 21	1,000,000
Argo-Cobalt Mines, Limited	Toronto	July 28	1,000,000
Atlantic Silver Mines, Limited	Cobalt	July 12	40,000
Bartlett Mines, Limited	Toronto	January 6	4,000,000
Bateese Mines, Limited	Toronto	January 5	500,000
Bellellen Silver Mines, Limited	Haileybury	November 23	2,500,000
Belmont Silver Mines of Kerr Lake, Limited	Toronto	May 6	2,000,000
Berkshire Mining Company, Limited	Haileybury	March 27	300,000
Big Bear Lake Mines, Limited	Toronto	November 19	40,000
Bison Consolidated Mines, Limited	Haileybury	April 20	2,000,000
Black Mines, Limited	Toronto	April 26	2,000,000
Black Mines Consolidated, Limited	Toronto	August 17	3,000,000
Blairton Iron Mines, Limited	Toronto	January 8	40,000
Boston and Ontario Silver Mines Company, Limited	Toronto	December 4	40,000
Boston Portage Cobalt Silver Mines, Limited	Cobalt	January 29	40,000
Boyd-Gordon Mining Company, Limited	Toronto	January 6	1,000,000
Brewster Mining Company, Limited	Toronto	August 6	10,000
British Canadian Exploration and Mining, Limited	Toronto	April 13	2,000,000
Caledonia Gypsum Company, Limited	Hamilton	December 28	150,000
Canada Pipe and Steel Company, Limited	Toronto	October 29	100,000
Canadian-American Silver Mines, Limited	Toronto	June 2	40,000
Canadian Gowganda Silver Mines, Limited	Toronto	May 14	100,000
Canadian Northern Mines, Limited	Toronto	December 20	1,000,000
Cedar Lake Cobalt and Silver Mines, Limited	Toronto	November 20	1,000,000
Chicago-Gowganda Mines Company, Limited	Toronto	September 21	1,000,000
Chief Matash Mines Company, Limited	Toronto	September 27	500,000
Clawson Silver Mines, Limited	Toronto	July 12	1,500,000
Clinton Mines Company, Limited	Toronto	December 16	1,000,000
Cobalt Delta Mining Company, Limited	Cobalt	March 11	40,000
Cobalt Holding Company, Limited	Windsor	February 11	200,000
Cobalt National Mines, Limited	Toronto	January 6	50,000
Cobalt Paymaster Mines, Limited	Toronto	March 22	2,000,000
Cobalt Wilber Mines, Limited	Toronto	February 24	40,000
Consolidated Oil-Fields, Limited	Toronto	November 9	250,000
Crescent Silver Company, Limited	Toronto	March 11	40,000
Crown Majestic Mines, Limited	Toronto	October 1	1,000,000
Crown Star Mines Company, Limited	Toronto	November 16	1,000,000
Detroit Mines, Limited	Toronto	April 21	1,000,000
Diamonds and Gold, Limited	Toronto	February 8	2,000,000
Dominion Limestone Company, Limited	Port Colborne	December 3	50,000
Dominion Metals, Limited	Toronto	September 4	500,000
Dominion Ores, Limited	Windsor	June 29	250,000
Dominion Silver Mines, Limited	Ottawa	February 5	2,000,000
Doric Reserve Mines, Limited	Toronto	August 3	1,500,000
Dreadnought Mines, Limited	Ottawa	May 12	1,000,000
Dufferin Gowganda Mines, Limited	Toronto	January 11	1,000,000
E. B. Wood Cobalt Mines Company, Limited	Cobalt	September 9	40,000
Electric Smelting and Power Company, Limited	Toronto	August 3	4,000,000
Electro Steel Company of Canada, Limited	Toronto	October 15	100,000
Emerald Lake Iron Company, Limited	Toronto	February 22	10,000
Esperanza Syndicate, Limited	Toronto	February 15	40,000
E. T. Mining Company, Limited	Toronto	April 21	1,000,000
Fairplay Mining Company, Limited	Toronto	February 16	500,000
Foley Gold Mines Company, Limited	Fort Frances	April 20	1,000,000
Forest Reserve Silver Mines, Limited	Windsor	November 22	2,000,000
Forty-Six Mining Company, Limited	Haileybury	March 4	300,000
German American Mining Company, Limited	Cobalt	December 24	1,000,000
Gifford Gold Fields, Limited	Toronto	November 20	150,000
Giroux Lake Mines, Limited	Parry Sound	December 30	1,000,000
Gowganda and Montreal River Mines, Limited	Toronto	February 22	1,000,000
Gowganda Belle Mining Company, Limited	Toronto	March 3	2,000,000
Gowganda Centre Silver Mines, Limited	Toronto	January 11	1,000,000
Gowganda City Silver Mines, Limited	Toronto	January 19	1,000,000
Gowganda-Cobalt Venture Corporation, Limited	Toronto	March 20	2,500,000
Gowganda Elkhorn Mines, Limited	Chatham	March 29	1,000,000
Gowganda Exploration Company, Limited	Toronto	February 1	100,000
Gowganda 4 Mining Company, Limited	Toronto	May 12	1,000,000

Table XV.—Continued

Name of Company.	Head Office.	Date of Incorporation.	Capital Stock.
Gowganda Mine Producers, Limited	Toronto	June 16	$100,000
Gowganda Native Silver Mining Company, Limited	Toronto	March 11	1,000,000
Gowganda Premier Silver Mines, Limited	Toronto	January 22	500,000
Gowganda Prince Silver Mines, Limited	Toronto	January 29	1,000,000
Gowganda Prospecting Company, Limited	Ottawa	February 9	10,000
Gowganda Reserve Mines, Limited	Cobalt	July 16	500,000
Great North Company, Limited	Toronto	September 14	40,000
Grey Wolf Mining Company, Limited	Toronto	December 18	100,000
Guelph Oil and Gas Company, Limited	Guelph	September 17	40,000
Hagersville Stone Company, Limited	Hagersville	July 28	40,000
Haileybury Frontier Mining Company, Limited	Haileybury	July 31	1,250,000
Hall Gowganda Mining and Development Company, Ltd.	Toronto	October 1	1,000,000
Hanging Stone Silver Mines, Limited	Toronto	February 15	1,000,000
Harman Mining and Leasing Company, Limited	Cobalt	August 4	500,000
Hassan Mines Development Company, Limited	Ottawa	March 3	500,000
Havilah Gold Mines, Limited	Sault Ste. Marie.	January 13	1,000,000
High Falls Mining Company, Limited	Ottawa	September 27	2,500,000
James Bay Company, Limited	Toronto	March 17	100,000
Kaiser Gold Mining Company, Limited	Windsor	May 21	1,000,000
Kirkfield Portland Cement Company, Limited	Toronto	May 10	250,000
Lang-Caswell Cobalt Mines, Limited	Toronto	May 28	1,500,000
LaSalle Mining Company, Limited	Toronto	April 30	100,000
Latour Lake Mines, Limited	Cobalt	October 7	1,000,000
Laurie Silver Mines, Limited	Toronto	January 7	1,000,000
Lavine Lake Silver Mining Company, Limited	Toronto	October 18	300,000
Lemieux Silver Mining Company, Limited	Toronto	January 18	1,000,000
LeRoy Lake Silver Mines, Limited	Toronto	August 23	1,200,000
Logan-Cobalt Silver Mines, Limited	Midland	April 27	500,000
Lorrain, Limited	Hamilton	October 23	1,500,000
Luttrell Gold Separator Company, Limited	Woodstock	January 22	100,000
MacDuff Mining Company, Limited	Milton	February 9	40,000
McDonald Feldspar Company, Limited	Toronto	May 17	40,000
McIntosh Mines, Limited	Toronto	November 10	1,500,000
McLean Temagami Mining Company, Limited	Ottawa	December 7	1,000,000
McNaughton Silver Mine, Limited	Hamilton	October 21	2,000,000
Magna Canadian Silver Mines, Limited	Haileybury	May 17	1,000,000
Mann Mines, Limited	Toronto	March 23	2,500,000
Mapes Johnston Mining Company, Limited	Toronto	August 16	1,000,000
Maple Leaf Portland Cement Company, Limited	Toronto	March 9	150,000
Massada Silver Mines, Limited	Ottawa	December 22	500,000
Merida Mines Company, Limited	Toronto	June 8	500,000
Metagami Mines, Limited	New Liskeard	March 22	500,000
Michigan Cobalt Mines Company, Limited	Windsor	February 2	2,000,000
Miller & Gowganda Mines, Limited	Toronto	March 17	1,500,000
Miller Flatstone Mines, Limited	Toronto	July 27	2,000,000
Millerett Silver Mining Company, Limited	Elk Lake City	July 8	500,000
Mines Holding Company, Limited	Cobalt	May 5	25,000
Montreal-Everett Lake Mining Company, Limited	Toronto	March 26	1,500,000
Montreal-James Mines of Ontario, Limited	Toronto	June 21	40,000
Montreal River "Silver King" Mines, Limited	Toronto	January 13	2,000,000
Montreal-Toronto Syndicate, Limited	Toronto	December 4	250,000
Montrose Cobalt Mining Company, Limited	Toronto	March 17	1,000,000
Morton Silver Mining Company, Limited	Toronto	July 14	700,000
Murilo Gold Mining Company, Limited	Port Arthur	November 30	500,000
Muskoka Sand and Gravel Company, Limited	Toronto	March 22	40,000
National Iron Works, Limited	Toronto	March 15	200,000
Nelson Cobalt Silver Mines, Limited	Cobalt	October 1	750,000
Newfoundland Marble Company, Limited	Toronto	January 6	100,000
North American Silver Mining Company, Limited	Toronto	January 8	2,000,000
North British Mining Company, Limited	Toronto	May 20	1,000,000
North Western Gas Company, Limited	Toronto	June 1	500,000
Northern Provincial Mining Company, Limited	Cobalt	November 17	1,500,000
Oil and Gas Producers, Limited	Hamilton	March 20	1,000,000
Ontario Gowganda-Cobalt Consolidated Company, Limited	Toronto	February 8	40,000
Ontario Sulphur Mines, Limited	Toronto	July 13	1,000,000
Permanent Cobalt Mines, Limited	Toronto	January 5	1,000,000
Pioneer Cobalt Silver Mining Company, Limited	Toronto	January 18	1,500,000
Port Arthur Exploration Company, Limited	Port Arthur	November 5	100,000
Red Willow Coal Company, Limited	Toronto	March 24	1,000,000
Reilly Mining Corporation, Limited	Toronto	March 17	1,000,000
Rib Lake Mining Company, Limited	Toronto	December 20	40,000
Richelieu Silver Mines, Limited	Toronto	November 13	1,500,000
Ridgetown Fuel Supply Company, Limited	Ridgetown	October 28	60,000
Rondeau Gas and Oil Company, Limited	Kingsville	January 19	100,000
Rosey Creek Mines, Limited	Toronto	December 15	75,000
Rubicon Silver Mining Company, Limited	Toronto	March 4	500,000
Ryan (Gowganda) Mining Company, Limited	Toronto	February 22	1,500,000
Sagdola Silver Syndicate, Limited	Toronto	October 16	100,000
Shining Tree Lake Silver Mines, Limited	New Liskeard	November 4	250,000
Silver Country Mines, Limited	Toronto	July 8	1,000,000
Silver Eagle Mining Company, Limited	Toronto	February 3	1,000,000
Silver Falls Mines, Limited	Niagara Falls	July 22	1,000,000
Silver Giant Mining Company, Limited	Haileybury	October 7	2,000,000
Silver Lake Helena Mining Company, Limited	Toronto	June 5	1,000,000
Silver Lake Queen, Limited	Toronto	June 9	600,000
Silver Mines of Canada, Limited	Toronto	November 19	5,000,000

Table XV.—Continued

Name of Company.	Head Office.	Date of Incorporation.	Capital Stock
St. Anthony Prospecting, Developing and Mining Company, Limited	Cobalt	January 28	$500,000
Sturgeon Lake Gold King Mining and Development Company, Limited	Fort William	March 1	200,000
Superior Steel Company, Limited	Toronto	April 15	250,000
Sutherland Cobalt Silver Mines, Limited	Toronto	June 7	1,000,000
Swansea Smelting and Refining Company, Limited	Toronto	November 17	100,000
Tee Arr Mining Company, Limited	Toronto	August 19	1,000,000
Temagami Reserve Mines, Limited	Toronto	January 18	1,000,000
The Actinolite Mining Company, Limited	Belleville	March 4	100,000
The Aldrich Natural Gas and Oil Company, Limited	Selkirk	June 3	40,000
The Beacon Mines, Limited	Cobalt	May 6	40,000
The Black Rock Mines, Limited	London	August 17	2,000,000
The Blakely Oil Company, Limited	Chatham	March 19	25,000
The Blind River Exploration and Mining Company, Limited	Blind River	August 4	25,000
The Blind Trail Silver Mining Company, Limited	Toronto	October 18	40,000
The Boland-Thompson Silver Mining Company, Limited	Ottawa	January 21	1,000,000
The Bonsall Mines, Limited	Ottawa	April 21	3,000,000
The Britannia Silver Mines, Limited	Toronto	September 25	3,000,000
The Buffalo Gowganda Silver Mines, Limited	Toronto	October 26	2,000,000
The Cambrian Mining and Development Company, Ltd.	Port Arthur	August 9	1,000,000
The Canada Northern Explorers, Limited	Sault Ste. Marie	August 31	500,000
The Canada Refining and Smelting Company, Limited	Toronto	November 29	40,000
The Canadian Arsenic Company, Limited	Belleville	October 4	500,000
The Canadian Pressed Brick Company, Limited	Hamilton	December 22	40,000
The Canadian Treadwell Gold Mines Company, Limited	Matheson	October 21	500,000
The Cobalt Commercial Mines, Limited	Toronto	March 23	300,000
The Cobalt Gowganda Consolidated Mining Company, Limited	Toronto	May 15	40,000
The Cobalt Laguna Mining Corporation, Limited	Cobalt	February 9	300,000
The Cobalt Silver Syndicate, Limited	Ottawa	November 2	600,000
The Cobalt Star Mining Company, Limited	Haileybury	October 11	2,000,000
The Cobalt Twins Silver Mining Company, Limited	Cobalt	September 20	2,000,000
The Crown Portland Cement Company, Limited	Wiarton	May 13	800,000
The Delaware-Cobalt Mining and Exploration Company, Limited	Toronto	July 23	40,000
The Diabase Silver Mines, Limited	Toronto	January 11	1,250,000
The Diamantina Placer Mines, Limited	Toronto	February 12	500,000
The Don Valley Brick Company, Limited	Toronto	January 22	500,000
The Dundas and Wapak Mining Company, Limited	Dundas	February 16	40,000
The Ellis Silver Mining Company, Limited	Toronto	March 19	1,000,000
The Empire Refining Company, Limited	Walkerville	June 16	200,000
The Everett Mines, Limited	Toronto	January 29	1,500,000
The Fedora Cobalt Silver Mining Company, Limited	Cobalt	November 25	1,000,000
The Fonthill Gravel Company, Limited	Thorold	October 21	50,000
The Frontier Consolidated Mining Company, Limited	Haileybury	June 8	1,000,000
The Gargantua Mining Company, Limited	Ottawa	November 4	40,000
The Giroux Lake Cobalt Silver Mining and Milling Company, Limited	Toronto	July 8	1,000,000
The Gladstone Mines, Limited	Toronto	February 11	1,000,000
The Glenorchy Gold Mining and Development Company, Limited	Fort Frances	July 13	500,000
The Gold Pyramid Mining Company of Larder Lake, Limited	Ottawa	March 4	1,000,000
The Golden Rose Mining Company, Limited	Sudbury	April 16	500,000
The Goodwin Lake Cobalt Mines, Limited	Cobalt	January 11	40,000
The Gray Mining Company, Limited	Chesley	November 12	250,000
The Hamilton Fabre Mining Company, Limited	Hamilton	July 20	2,000,000
The Hillcrest Mining Company of Cedar Lake, Limited	Toronto	August 31	1,000,000
The Hudson Bay Mines, Limited	New Liskeard	July 16	3,500,000
The Hudson Valley Cobalt Mines, Limited	Cobalt	January 29	40,000
The Imperial Cement Company, Limited	Owen Sound	May 5	200,000
The International Mining and Information Exchange, Limited	Toronto	May 11	200,000
The International Tool Steel Company, Limited	Toronto	November 13	750,000
The Iron Mask Cobalt Silver Mines Company, Limited	Haileybury	November 19	500,000
The J. C. Mackay Mines, Limited	Toronto	June 15	100,000
The John Black Mining Company, Limited	Toronto	January 28	1,500,000
The Langham Cobalt Mines, Limited	Ottawa	February 15	1,200,000
The Lauzon Lake Company, Limited	Toronto	April 27	500,000
The LeHeup Mining Company, Limited	Toronto	January 29	1,500,000
The Liberty Silver Mines, Limited	Toronto	November 19	750,000
The McRae, Downey Prospecting Company, Limited	Elk Lake	March 31	100,000
The Malouf Mines, Limited	Haileybury	April 20	200,000
The Mascot Mining Company, Limited	Toronto	May 18	500,000
The Mayflower Silver Mining Company, Limited	Haileybury	January 8	150,000
The Merchants Gas Company of Dunnville, Limited	Dunnville	November 30	5,000
The Meteor Silver Mining Company, Limited	Cobalt	November 6	200,000
The Mountain Lake Mining and Developing Company, Limited	Toronto	February 15	500,000
The Nanticoke Natural Gas Company, Limited	Nanticoke	October 12	3,000
The New Ontario Slate Company, Limited	New Liskeard	November 29	500,000
The Northern Mining Company, Limited	Ottawa	August 9	100,000
The Obushkong Mines, Limited	Haileybury	August 17	250,000
The O'Connor Silver Mines, Limited	Cobalt	December 24	500,000

Table XV.—Concluded.

Name of Company.	Head Office.	Date of Incorporation.	Capital Stock.
The O'Kelly Mines, Limited	Toronto	February 15	$5,000,000
The Ontario Consolidated Mines, Limited	Toronto	April 26	350,000
The Ontario Silverfields, Limited	Toronto	June 18	1,000,000
The Ore Chimney Mining Company, Limited	Fort Erie	October 11	600,000
The Ottawa Gowganda Mining Company, Limited	Ottawa	June 17	500,000
The Parry Sound Mica Feldspar Company, Limited	Toronto	March 8	100,000
The Plymouth Silver Mining Company, Limited	Cobalt	June 21	40,000
The Porcupine Lake Gold Mines, Limited	Toronto	December 4	1,000,000
The Prospectors' Exploration and Development Company, Limited	Toronto	August 10	350,000
The Reliance Silver Mines, Limited	Toronto	September 4	1,500,000
The Right of Way Mines, Limited	Ottawa	September 11	2,000,000
The Rosehill Silver Mining Company, Limited	Toronto	May 20	40,000
The Safety Development and Mining Company, Limited	Haileybury	November 3	75,000
The Sarnia Northern Ontario Mining and Development Company, Limited	Sarnia	March 4	750,000
The Saskatchewan Mining and Development Company, Limited	Toronto	November 10	2,000,000
The Saville Prospecting and Exploration Company, Limited	Toronto	January 11	500,000
The Sharon Mines, Limited	Cobalt	May 12	20,000
The Shaw Magnetic Sand Steel Company, Limited	Toronto	May 11	150,000
The Silver Age Mining Company, Limited	Toronto	April 21	1,000,000
The Silver Cliff Mines, Limited	Ottawa	September 15	2,000,000
The Silver Streak Mining Company, Limited	Toronto	April 5	40,000
The Silver-Tunnel Mining Company, Limited	Toronto	March 4	1,500,000
The Silver Wave Mines, Limited	North Bay	October 30	1,000,000
The South Lorrain Silver Mining Company, Limited	Haileybury	February 1	50,000
The St. Catharines Exploration and Prospecting Company, Limited	St. Catharines	February 19	40,000
The Stanworth Martin Stone Company, Limited	Port Arthur	March 2	40,000
The Sterling Mines, Limited	Ottawa	September 14	3,000,000
The Susquehanna Mining Company, Limited	Niagara Falls	January 12	30,000
The Tallon Mining Company, Limited	Haileybury	October 1	1,000,000
The Toronto-Buffalo Cobalt Mining Company, Limited	Toronto	November 11	1,000,000
The Union Creek Mining and Milling Company, Limited	Peterboro'	November 29	100,000
The Union Mining and Transport Company, Limited	Toronto	May 6	40,000
The Vermilion River Copper Company, Limited	Sudbury	May 11	50,000
The Victoria Creek Gold Mines, Limited	Toronto	January 18	200,000
The Youngstown Mining Company, Limited	Toronto	September 13	750,000
Thompson Gowganda Mining Company, Limited	Toronto	September 29	500,000
Trafalgar Silver Cobalt Mines, Limited	Toronto	December 18	1,500,000
Tudhope Silver Mines, Limited	Haileybury	September 21	1,000,000
United Fuel Supply Company, Limited	Sarnia	July 6	500,000
United States Silver Mines, Limited	Windsor	January 26	1,000,000
Venture Corporation of Canada, Limited	Toronto	December 29	40,000
Victor Silver Mines, Limited	Toronto	April 13	2,000,000
Wahnapitae Cobalt Silver Mines, Limited	Toronto	October 8	750,000
Waldman Silver Mines, Limited	Toronto	July 20	2,500,000
Wealthy Mines, Limited	North Bay	August 6	1,000,000
Welcome Silver Mines, Limited	Toronto	February 19	40,000
Wellington Mines, Limited	Guelph	December 3	750,000
White Bear Lake Silver Mining Company, Limited	Toronto	August 18	2,000,000
White Reserve Mines, Limited	Toronto	June 14	2,500,000
Wigmore Gold Mines of Sturgeon Lake, Limited	Toronto	May 20	500,000
Willett Silver Mines, Limited	Toronto	May 3	2,000,000
Wyandoh Silver Mines, Limited	Toronto	October 8	3,000,000
			$236,883,000

Table XVI.—Mining Companies Licensed in 1909

Name of Company.	Provincial Head Office.	Date of License.	Capital.
Canada Cement Company, Limited	Toronto	September 30	
East Tilbury (Canada) Oilfields, Limited	Chatham	October 12	$250,000
London Lorrain, Limited	Haileybury	November 30	£5,000
Mud River Silver Mining Company, Limited	Haileybury	March 3	$5,000
Pacific Coal Mines, Limited	Toronto	April 14	
The Canada Iron Corporation, Limited	Toronto	March 26	
The Colonial Development Syndicate	Toronto	Dec. 24, 1908	$40,000
The Jacobs Exploration Company, Limited	Toronto	March 11	
Tranquille Creek Development Company of Canada, Limited	Ottawa	December 16	

In cases where the capital is not given, the company is of Dominion incorporation, and the amount of the capital to be used in Ontario is not mentioned in the license.

The Mining Divisions

Under the Mining Act of Ontario the administration of the mineral domain of the Crown, in so far as the disposition of lands for mining purposes is concerned, is to a large extent in the hands of the Mining Recorders. Each Recorder has jurisdiction over the Mining Division for which he is appointed, his duties being to record applications for mining claims, to settle disputes between contesting applicants, and generally to put the provisions of the Mining Act into effect. There is an appeal from the decision of the Recorder to the Mining Commissioner, who is clothed by the Act with judicial powers in all matters pertaining to mining lands previous to the issue of the patent. From the Mining Commissioner's judgment an appeal may in most cases be taken to the Divisional Court, and thence to the Court of Appeal. It is seldom, however, that a case reaches the Court of Appeal. Most disputes are adjusted by the Recorders, but there is always a considerable number of contestants who demand the adjudication of their rights by the Mining Commissioner. So far the process provided by the Mining Act for the settlement of disputes has worked with much satisfaction, and the Mining Commissioner's skill and experience in this particular branch of the law enable him to decide all cases brought before him with promptitude. The Mining Commissioner, Mr. Samuel Price, barrister, St. Thomas, has now occupied the position for nearly four years. During this time the cases tried by him have involved most of the salient points in the mining law, and a manual dealing with the principles thus established and the cases concerning them would probably be useful for litigants, either actual or prospective, as well as for members of the legal profession interested in mining suits or mining law, and will probably be prepared.

Below is given a list of the Mining Divisions of the Province, with the name and address of the Recorder, and a statement of the receipts of the several offices for the ten months ending 31st October last:—

Table XVII.—List of Mining Divisions, 1909

Mining Division.	Name and P.O. Address of Recorder.	Receipts.			Total receipts.
		Purchase money.	Miner's licenses.	Recording fees, etc.	
		$	$	$	$
Kenora	W. L. Spry, Kenora	2,096 40	1,404 00	1,872 15	5,372 55
Port Arthur	J. W. Morgan, Port Arthur	885 00	3,906 00	4,582 00	9,373 00
Sault Ste. Marie	S. T. Bowker, Sault Ste. Marie	1,141 66	2,872 00	2,655 00	6,668 66
Sudbury	C. A. Campbell, Sudbury	363 81	5,182 00	10,801 00	16,346 81
Montreal River	Albert Skill, Elk Lake	2,336 52	17,999 00	29,060 15	49,395 67
Gowganda	H. E. Sheppard, Gowganda	319 00	7,876 00	34,387 65	42,582 65
Temiskaming	George T. Smith, Haileybury	10,572 91	16,838 50	12,252 65	39,664 06
Coleman	T. A. McArthur, Cobalt	5,012 82	9,276 00	2,592 75	16,881 57
Larder Lake	J. A. Hough, Larder Lake	1,143 00	1,318 15	2,376 00	4,837 15
Parry Sound	H. F. McQuire, Parry Sound	.....	536 00	459 00	995 00
	Total	23,871 12	67,207 65	101,038 35	192,117 12

The remainder of the money received for sale and lease of lands, and for miner's licenses, permits and fees, was taken in at the Department in Toronto.

The Porcupine Division

Following upon the discoveries of gold at Porcupine lake, and in order to provide prospectors with facilities for recording their claims on the spot without having to travel to Haileybury or Sudbury, as the case might be, a new Mining Division, called the Porcupine Division, was established by Order in Council dated 27th January, 1910. Portions of the Temiskaming, Sudbury and Montreal River Mining Divisions were detached to form this Division, the boundaries of which, as set out in the Order in Council, are given below. Mr. Arthur E. D. Bruce, assistant at Haileybury, was appointed Recorder, and the headquarters of the Division were fixed at the townsite of Porcupine, at the east end of Porcupine lake.

The description of the Division is as follows:

(1) That part of the Judicial District of Sudbury described as follows: Commencing at the 138th mile post on the meridian line run by Ontario Land Surveyor Alexander Niven in 1896 and 1898, as the boundary between the Judicial Districts of Nipissing and Sudbury, which point marks the northeast angle of the township of Gowan; thence west astronomically along the north boundary of the townships of Gowan, Wark, Kidd and Macdiarmid to the northwest angle of the latter, a distance of 24 miles more or less; thence continuing due west astronomically along O.L.S. Alexander Niven's base line run in 1905, a distance of 12 miles, to the 18th mile post thereon; thence south astronomically 42 miles; thence east astronomically 36 miles more or less to the 96th mile post on said Alexander Niven's meridian line, forming the boundary beween the Judicial Districts of Nipissing and Sudbury; thence north astronomically along said district boundary 42 miles to the place of beginning, including within said described area the surveyed townships of Gowan, Wark, Kidd, Macdiarmid, Jamieson, Jessop, Murphy, Hoyle, Whitney, Tisdale, Mountjoy and Godfrey, and the unsurveyed townships of Shaw, Fife and Connaught south of the townships of Whitney, Tisdale and Mountjoy respectively, containing by admeasurement 1,512 square miles more or less.

(2) That part of the Judicial District of Nipissing within the hereinafter described limits:

Commencing at the 138th mile post on Ontario Land Surveyor Alexander Niven's meridian line forming the boundary line between the Judicial Districts of Nipissing and Sudbury as run in 1896 and 1898, which point marks the northwest angle of the township of Evelyn; thence east astronomically along the north boundary of said township six miles more or less to the northeast angle thereof; thence south astronomically six miles to the northwest angle of the township of German; thence east astronomically along the north boundary thereof six miles to the northeast angle thereof; thence south astronomically along the east boundary of the said township of German and along the east boundary of the townships of Macklem, Thomas and Blackstock, a distance of 24 miles more or less to the southeast angle of the latter; thence east astronomically along the south boundary of the township of Timmins, 3 miles 45 chains, to the centre of a small pond on the canoe route between the Great Northern Bend on the Montreal river and Night Hawk lake; thence southerly along said canoe route to the north end of Trout lake, and southerly through the centre of Trout lake and along said canoe route to a point in the Great Northern Bend of said Montreal river due east astronomically from the 96th mile post on said district boundary; thence west astronomically to said 96th mile post, a distance of 15 miles more or less; thence north astronomically along said district boundary, a distance of 42 miles to the place of beginning, to include the surveyed townships of Evelyn, Matheson and German, and the unsurveyed townships of Cody, Macklem, Thomas, Carman, Langmuir and Blackstock, containing by admeasurement 520 square miles more or less, said two parcels containing 2,032 square miles.

Brief reports from the several Mining Recorders, dealing with the business transacted in their offices for the year ending 31st December, 1909, are herewith appended:—

Kenora

Recorder, W. L. Spry, Kenora, who succeeded C. W. Belyea, 21st September, 1909.

Miner's licenses issued, 196; renewals, 75; mining claims recorded, 102.

Port Arthur

Recorder, J. W. Morgan, Port Arthur.

Miner's licenses issued, 647; renewals, 274; mining claims recorded, 475.

Twenty-five claims were recorded for placer gold on Savant lake, but owing to difficulty in access very little can be done on these claims until spring. Silver has been discovered on Black Bay peninsula, and gold north of Lynx lake. These are in new territory, and no doubt there will be extensive prospecting in both localities when the snow leaves the ground.

The work of the office has more than doubled as compared with 1908.

Sault Ste. Marie

Recorder, S. T. Bowker, Sault Ste. Marie.

Miner's licenses issued, 344; renewals, 157.

Sudbury

Recorder, C. A. Campbell, Sudbury, who succeeded F. F. Lemieux, deceased. Mr. Campbell was appointed 6th January, 1910.

Miner's licenses issued, 823; renewals, 298; mining claims recorded, 1,859.

Gold was reported from Secord township as existing in large bodies of granite or conglomerate containing quartz, and carrying from $2 to $7 per ton. Iron claims were recorded (in 1910) on P. L. S. Sinclair's exploration line of 1867 about five miles east of Peter Long's lake. Staking for silver was active at Rosie creek and Esker lake. Many claims were recorded for gold in the vicinity of Tisdale and Mountjoy townships prior to this territory being included in the new Porcupine Mining Division.

Montreal River

Mining Recorder, Albert Skill, Elk Lake.

Miner's licenses issued, 1,540; renewals, 1,039; mining claims recorded, 2,573; certificates of record granted, 508; ditto work, 251.

The year 1909 has been the most active one in the history of the Division. Notwithstanding the loss of the territory added to the Gowganda Division, the receipts more than doubled those of 1908. About 500 claims have been staked in the township of Shillington and in the unsurveyed territory lying to the north. Considerable work has been performed in the Maple Mountain district, and several rich discoveries of silver are reported from that neighborhood.

Gowganda

Mining Recorder, H. E. Sheppard, Gowganda.

Miner's licenses issued, 995; renewals, 283; certificates of record granted, 934; ditto work, 210; mining claims recorded, 3,064.

There is considerable activity in mining operations in the vicinity of what is known as the Mann Ridge on the west side of Gowganda lake, also at Miller lake, Calcite lake and Bloom lake.

New discoveries of silver are reported from Smoothwater and Shining Tree lakes, also on Rosie creek and near Phoenix.

Approximately the following proportions of the townships mentioned have been staked out: Milner, seven-eighths; Van Hise, Haultain, Nicol, Leith, three-quarters each; Tyrrell, nine-sixteenths; Leonard, five-eighths; Morel, one-half; Brewster, one-third; Rankin, Raymond, Charters, N. Williams, Ray, Donovan, Dufferin, one-fourth each; Knight, one-sixth; Leckie, Corley, Gamble, Corkill, one-ninth each; Gamble, one-thirty-sixth.

Temiskaming

Mining Recorder, George T. Smith, Haileybury.

From the 1st of January to 31st October, 1909, 1,399 miner's licenses were issued, 1,565 miner's licenses were renewed, and 1,343 applications for mining claims recorded. From 1st of November to 31st December, 1909, 398 miner's licenses were issued, and 1,038 applications for mining claims recorded, making in all for the twelve months ending 31st December, 1909, 1,737 miner's licenses issued, 1,565 renewal licenses issued, 2,381 applications for mining claims recorded.

While the year 1909 was a fairly active one throughout the Province, the Porcupine lake gold discoveries formed the sensational feature. The first claim in this section was recorded on 20th December, 1906, when Mr. E. O. Taylor, of Toronto, located what is known as "E.B. 12," in the township of Shaw, on a discovery of iron showing traces of gold. A number of claims were recorded in the month of July, 1907, on lots 10 and 11 in the 1st Concession of the township of Whitney, the first of which was filed on 9th July by

Mr. Ernest R. Ostrom, of Haileybury, on behalf of Mr. Wm. J. Kernahan, of Toronto, on a discovery of gold-bearing quartz. Additional claims were recorded in the early part of 1908, both in these townships and in the vicinity of Night Hawk lake, but nearly all were forfeited for want of performance of development work.

Mr. John S. Wilson, of Massey, Ont., appears to have been the first applicant in 1909 in the Porcupine lake gold fields, having filed his first application on 22nd June, 1909, for the N.E. ¼, S. ½ Lot 2, Con. 2, Whitney, which is one of the claims that afterwards became famous as the "Wilson-Edwards gold claims".

The Way-Bannerman, Tremblay-Frood and Hollinger-McMahon claims were located in July and August, after which the staking became general, the reported discoveries extending from the townships of Shaw, Mountjoy, Godfrey, Tisdale, Jamieson and Whitney to the Temagami Reserve,

The country in the vicinity of South Lorrain had a very active and satisfactory season, and considerable development work has been done in the townships of Munro, Guibord, Clergue and Dundonald. A number of claims were also recorded in the unsurveyed district west of the township of Holmes, adjacent to Canoe lake. A good deal of development work was also done in the townships of Lorrain and Bucke, although no ore was shipped from either of these townships.

Reports come in from time to time of valuable discoveries along the line of the Transcontinental railway, but so far nothing of any great importance appears to have materialized.

Coleman

Mining Recorder, T. A. McArthur, Cobalt.

Miner's licenses issued, 998; renewals, 800; mining claims recorded, 150.

Larder Lake

Mining Recorder, J. A. Hough, Larder Lake.

Miner's licenses issued, 64; renewals, 134; mining claims recorded, 180.

New finds of gold were made during the year in the townships of Gauthier and Skead, and some excellent samples brought out from both localities.

Parry Sound

Mining Recorder, H. F. McQuire, Parry Sound.

Miner's licenses issued, 69; renewals, 51.

There have been no new discoveries. In the township of Lount there is some activity, certain American capitalists having a considerable tract under option and being now engaged in testing the same for iron and copper.

Government Diamond Drills

Drill "C" was not in commission during the year.

Drill "S," under the management of Mr. J. A. McVicar, was operated near Cobalt on the property of the Silver Bar Mining Company, Limited. In all four holes were drilled. Work was started February 6th, 1909, and finished July 23rd, 1909. The total depth drilled was 1,192 feet, and the average daily footage was nearly 9.7 feet. The gross cost of the work was $6,836.21, or $5.73 per foot. The net cost, after deducting 35 per cent. borne by the Department, was $4,443.56, or $3.78 per foot. Two shifts were run during each 24 hours.

No. 1 Hole.—Direction due north, angle 63½ degrees, reached a depth of 425 feet and pierced the following formations: Conglomerate, 50 feet; cobalt ore, 2 inches; Keewatin, 361 feet; calcite, 2 inches; Keewatin, 13 feet 8 inches.

No. 2 Hole.—At a depth of 50 feet in the diabase this hole was abandoned owing to the broken nature of the ground and its tendency to cave on the bits. The angle was 15 degrees.

No. 3 Hole.—Direction N. 10 degrees, E. angle 20 degrees, depth 294 feet. The log given by Mr. McVicar is as follows: boulder clay, 13 feet; diabase, 17 feet; Keewatin, 85 feet; cobalt ore, ½ inch; Keewatin, 14 feet 7½ inches; cobalt ore, 1½ inches; Keewatin, 164 feet 2½ inches.

No. 4 Hole.—Direction S. 70 degrees E., angle 20 degrees, depth 360 feet. The core showed: boulder clay, 18 feet; remainder, Keewatin.

As already stated, both plants have been sold, and the Department has discontinued the practice of supplying drills for prospecting purposes.

Provincial Assay Office

Mr. N. L. Turner, Provincial Assayer, reports as follows:—

The Provincial Assay Office was established in July, 1898, by the Ontario Government as an aid to the mineral development of the Province. During the twelve years of its existence it has been of great service not only to the Bureau of Mines, but also to the general public. The fees charged have been kept as low as possible, in order that all may be able to send their samples in for examination and report. This price list is maintained without regard to charges levied by other offices and is from 25 to 50 per cent. lower than that of private assayers. No attempt, however, is made to advertise the office or in any way compete with others engaged in this line of work. The office is equipped with all the necessary apparatus for the examination of the various ores of the Province.

During the past year no particular part of the Province can be said to have supplied the bulk of the samples, specimens having been received from all parts of the Province and also from Quebec, New Brunswick, Nova Scotia, Newfoundland, Manitoba, British Columbia, and various parts of the United States. It will be seen that the office is pretty well known and that it has built up a reputation for accurate work at a low cost.

Many fine samples of hematite and magnetite were received from the northern part of the county of Hastings and adjoining townships.

As usual, numerous samples of cobalt-silver ore were received from Cobalt and the adjoining districts, also nickel-bearing pyrrhotite from Sudbury. Samples of gold ore were received from the Kenora district, as well as some very fine samples of copper ore.

During the latter part of the year a sample of very good coal was sent in, said to have been found in New Ontario, but so far no further information has been obtainable regarding it.

From other parts of the Province were received samples of gold and silver ore, copper, lead, zinc, and also non-mettalic minerals such as limestone for cement purposes, feldspar, corundum, mica, etc.

During the year there have been numerous inquiries for good deposits of mica and fluorite, and a ready market could be found for these minerals, particularly the latter.

Work for Bureau of Mines

1. Checking the sampling of cobalt-silver ores shipped from the O'Brien, Crown Reserve and Hudson Bay Mines to the smelters at Copper Cliff, Deloro and Thorold.
2. Assaying the check samples and totalling the silver values of the cars of ore.
3. Analysis of iron ore samples for the report on the iron ores of Ontario.
4. Analysis of rock specimens from various parts of the Province.
5. Identification and analysis of samples submitted by the officials of the Bureau.

Work for the Public

1. Issuing reports, consisting of assays, analyses, and identification of samples submitted for examination.

2. Supplying information to owners, buyers and others connected with the mineral development of the Province.

3. Special testing of minerals to ascertain the best method for the extraction of their values.

The number of samples submitted for examination during the year was 1,063. Fees to the amount of $738.75 were collected and transmitted to the Department, and work was performed for the Bureau of Mines to the value of $1,320.50, making a total value of the work done $2,059.25.

Assays and Analyses Made

The following list of determinations will show the laboratory work for the year:—

	Assays for Public.	Assays for Bureau.	Total.
Gold	317	38	355
Silver	281	266	547
Copper	49	....	49
Cobalt	22	110	132
Nickel	7	5	12
Manganese	2	....	2
Molybdenum	2	....	2
Zinc	8	....	8
Lead	11	....	11
Platinum	4	....	4
Arsenic	20	12	32
Tin	3	....	3
Bismuth	2	....	2
Chromium	...	1	1
Vanadium	2	....	2
Antimony	2	....	2
Concentration gold tests	1	....	1
Amalgamation gold tests	4	2	6
Total	737	434	1,171

	Analyses for Public.	Analyses for Bureau.	Total.
Metallic iron	55	105	160
Ferric oxide	6	....	6
Ferrous oxide	....	3	3
Alumina	26	....	26
Silica	7	8	15
Lime	6	20	26
Magnesia	8	20	28
Potassium	2	....	2
Sodium	2	....	2
Sulphur	30	80	110
Phosphorus	24	54	78
Titanium	22	5	27
Carbon	5	....	5
Ash	1	1	2
Carbon dioxide	...	21	21
Loss on ignition	4	....	4
Moisture	3	....	3
Chlorine	....	1	1
Tungsten	1	....	1
Barium oxide	2	...	2
Insoluble	2	79	81
Complete qualitative analyses	3	....	3
Complete rock analyses	....	18	18
Miscellaneous	....	1	1
Total	209	416	625

Assays	1,171
Analyses	625
Identifications	103
Total	1,899

Methods of Analysis

The standard methods of analysis are used:—

Gold and silver by pot assay, using one half assay ton samples, and each sample being run in duplicate, thus eliminating any chance of error.

Silver in silver-cobalt ores:—A combination wet and dry method is used for this assay. For ore 2,000 ounces per ton and over, one-tenth assay ton is taken; for anything under that one-fifth is used. The sample is leached out with nitric acid, and the silver precipitated with hydrochloric acid. The solution is filtered and the residue washed with hot water and then dried on a scorifier. The paper is burned off carefully, and the remainder scorified in the usual manner.

For other assays standard methods are used, although the office adopts any newer and later methods, when proved, in order to keep up to date.

Notes

In sending in samples it is desirable to have them no more than three pounds in weight. All samples are sampled down and ground to 100-mesh, and where necessary, finer. Wet samples are dried at 107 degrees C., and analyses reported at that temperature.

Circulars giving list of fees and other particulars will be sent to anyone interested and also sample bags to send samples in. To insure a prompt report all fees must accompany samples.

Samples brought to the office will be examined free of charge. The following list will give the charges for the ordinary assays:—

Price List for Assays

	1 Sample.	3 to 5 Samples at one time, each.	6 or more Samples at one time, each.
	$ c.	$ c.	$ c.
Gold by fire method	1 00	0 90	0 75
Silver " "	1 00	0 90	0 75
Gold and silver by fire method	1 25	1 00	0 90
Gold by amalgamation assay for free gold	2 00	1 80	1 50
Copper by fire assay method	1 25	1 00	0 90
Copper by cyanide method	1 25	1 00	0 90
Copper by electrolytic method	1 25	1 00	0 90
Lead by titration method	1 25	1 00	0 90
Zinc " "	2 00	1 80	1 50
Nickel by electrolytic method	3 00	2 70	2 25
Platinum by fire assay "	2 00	1 80	1 50
Cobalt by electrolytic "	3 00	2 70	2 25
Arsenic by titration "	2 00	1 80	1 50
Manganese " "	3 00	2 70	2 25
Chromium " "	3 00	2 70	2 25
Antimony " "	2 00	1 80	1 50
Bismuth " "	2 00	1 80	1 50
Iron (metallic) " "	0 50	0 45	0 30
Molybdenum " "	2 00	1 80	1 50
Tin fire assay " "	2 00	1 80	1 55

A reduction of 15 per cent. on the total is allowed on 6 or more assays on one sample, and 20 per cent. on 10 or more assays on one sample.

MINING ACCIDENTS

By E. T. Corkill, Inspector of Mines

During the year 1909, at the mines regulated by the Mining Act of Ontario, there were 45 fatal accidents, causing the loss of 49 lives, being an increase of 2 over the previous year. Of the fatalities, 36 occurred below ground and 13 above ground. The total number of serious accidents in the mines of Ontario reported to the Bureau of Mines was 77, resulting in 49 men killed and 53 injured. Of the accidents reported 61 occurred below ground, and 16 above ground. The fatal accidents took place at mines operated by 30 different companies.

Analysis of Fatal Accidents

From an analysis of the fatalities in Ontario in 1909, it is found that 34.7 per cent. resulted from accidents due to danger inherent to the work itself; 10.2 per cent. from accidents arising out of defects in the mine workings; 8.2 per cent. from accidents through fault of fellow workmen; 40.8 per cent. due to accidents through fault of injured person, and 6.1 per cent. impossible to classify. This is an improvement in one respect over 1908. In that year 31.9 per cent. resulted from defects in the mine workings, while 1909 shows only 10.2 per cent. The marked increase is in the number of fatalities caused through the fault of the injured person. This increased from 14.9 per cent. in 1908 to 40.8 per cent. in 1909.

The 45 fatal accidents took place in the following months:—January, 3; February, 2; March, 6; April, 5; May, 3; June, 3; July, 4; August, 2; September, 5; October, 3; November, 1; December, 8.

An investigation and report were made in 38 out of the 45 fatal accidents that occurred during the year, besides a number of non-fatal accidents.

The following shows the number of men killed at the different classes of work:—

Machine men	17
Surface laborers	9
Machine helpers	8
Hand miners	5
Muckers	4
Timberman	1
Cage tender	1
Pipe fitter	1
Teamster	1
Crusherman	1
Brakeman	1
Total	49

In 1908 there were 47 men killed in Ontario, 39 below ground and 8 above ground. Of these deaths, 11 were due to falls of ground, or 23.4 per cent.; 13 to shaft accidents, or 27.6 per cent.; 11 were caused by explosives, or 23.4 per cent.; 4 by miscellaneous causes underground, or 8.5 per cent.; and 8, or 17.8 per cent., were due to casualties on the surface.

Of the 49 fatalities in 1909, 10.2 per cent. resulted from falls of ground; 20.4 per cent. from shaft accidents; 34.7 per cent. from explosives; 8.1 per cent. from miscellaneous causes underground, and 26.6 per cent. from accidents on the surface.

In comparing the two years, we find there was a marked decrease in fatalities from falls of ground, which were reduced from 11 in 1908 to 5 in 1909; there were also fewer shaft accidents. The fatalities from explosives were higher, being 17 in 1909, as against 11 in 1908. The number of miscellaneous accidents underground was the same, but there were more accidents on the surface, the number being 13 in 1909, compared with 8 in 1908. There were 36 fatalities underground in 1909, or 3 less than in 1908.

Cause and Location of Fatalities

The following schedule shows the cause and place of the fatal accidents in 1909:—

Falls of ground		5
Shaft Accidents:		
Falling from bucket while riding contrary to Act	1	
Falling from bucket	1	
Falling from bucket while overcome by gas	1	
Falling into shaft	1	
Objects falling from bucket	1	
Cage accidents	5	
		10
Accidents from Explosives:		
Premature explosion while loading or lighting hole	7	
Picking or putting bar into old hole in which explosive had been left	1	
Drilling into bottom of old hole	4	
Picking into explosive in muck	3	
Explosion while scaling	2	
		17
Miscellaneous Accidents Underground:		
Falling through timbers into stope	1	
Suffocation from gases resulting from blasts	2	
Piece of timber falling off cage	1	
		4
Accidents on Surface:		
Caught by elevator	1	
Struck or run down by train	2	
Explosion in rock house	1	
Thawing dynamite	1	
Walking over place where blast had been lighted	1	
Explosion of settler	2	
Blasting hot salamander in furnace	1	
Miscellaneous	4	
		13
Total		49

The following table gives the number of men killed in Ontario from 1900 to 1909; the number of persons employed in producing mines; the estimated number of persons employed in non-producing mines, and the death rate per 1,000 men employed. As shown by this table, the accident rate has been increasing from 1904 to 1908, that of 1909 being about the same as 1908. The increase is due to the expansion and activity of the mining industry in Ontario since the discovery of the high grade silver ores at Cobalt. Accidents from explosives are the main source of danger, and were ultimately the cause of 49 per cent. of the fatalities in 1909. The necessity for an inspection of explosives, which can only be instituted by the Dominion Government, is clearly proved by the death rate due to their use, not only in Ontario but throughout Canada:

Table showing Fatal Accidents in Mines of Ontario, 1900 to 1909

	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	Total.
Persons killed in producing and non-producing mines	17	13	10	7	7	9	11	22	47	49	192
Persons employed in producing mines	3,330	4,135	4,426	3,499	3,475	4,415	5,017	6,305	7,435	8,505	50,442
Persons employed in non-producing mines (estimated)	650	550	450	400	400	500	750	1,140	1,750	2,000	8,590
Total persons employed	3,980	4,685	4,876	3,899	3,875	4,915	5,767	7,345	9,185	10,505	59,032
Fatal accidents per 1,000 employed	4.27	2.77	2.05	1.79	1.80	1.83	1.90	2.99	5.11	4.66	3.25

The various fatal accidents are briefly described further on in this report, but the following remarks are given in elucidation of the several causes.

Falls of Ground

There were 4 accidents from this cause, resulting in the death of 5 men. Three of the fatalities took place in iron mines, namely, the Helen and Mayo, and two in the Crean Hill copper-nickel mine. The deaths from this cause in 1908 were 11, which shows a marked improvement in 1909.

The change in the Mining Act compelling the companies to keep scaling books, in which is entered the record of scaling done in the mine signed by the men doing it, has proved beneficial. Workmen are naturally careless, but if they know that after scaling the roof and walls they must sign a statement that they have left them in safe

condition, they are likely to be more careful in their work. The mines of Ontario, as a rule, have safer ground to work in than those of many other countries. Presuming on this, men sometimes get careless and work under ground that should be scaled.

At the Helen mine an accident occurred resulting in two men being crushed under about 50 tons of ore. This accident was caused by the ore falling away from a soft slip that cut across one wall of the stope. A long machine hole had been drilled under this and the ground had not been properly examined after the blast before the men returned to work.

Shaft Accidents

Although only ten men lost their lives from accidents of this sort in 1909, compared with 13 in 1908, it is not reassuring when we consider that 5 of these fatalities were the result of cage accidents. All of these accidents were the result of carelessness on the part of someone. Getting on or off moving cages was responsible for two of the deaths. This is a very dangerous practice, and anyone guilty of it should be dismissed. One cage tender was killed through someone, unknown, ringing the hoisting signal while he was putting the car on the cage. The cage started, causing him to fall down the shaft.

Bucket accidents have shown a decided decrease. Two workmen were prosecuted and convicted for violation of the law regarding bucket riding. There were no accidents during the year from falling crossheads. This improvement may be accounted for in part by the companies being compelled by law to have the crosshead so constructed that it cannot stick in the shaft without also stopping the bucket.

Accidents from Explosives

The fact that 17 men lost their lives through explosive accidents underground in 1909 is also discouraging. This is a cause of accident that is exceedingly difficult to guard against. There were last year in all 24 fatalities caused by explosion or from gases, or 49 per cent. of the total fatalities. There is no country that publishes accurate statistics where the accidents from explosives constitute so large a percentage of the total number. It is not easy to account for this. There is no doubt that the extremes of heat and cold make the handling of explosives more dangerous. There is also a probability that some of the explosives used by the mines are not uniform in composition.

So-called "premature" explosions, which are generally classed as quick fuse, are very prevalent, having resulted in 7 fatalities in 1909. These accidents are generally caused by the fuse spitting into the powder in one of the holes in which no tamping has been placed. The necessity for putting tamping on powder in the holes, outside of the economic importance, has been shown in several cases of accident. No miner should be allowed to light a round of holes unless he has tamping in every one. Two men were killed in 1909 while loading holes. The only cause that could be found for these two accidents was that in pushing the powder into the hole too much force was exerted, causing the gelignite to explode. The old, careless practice of starting to drill in the bottom of old holes was again responsible for 4 deaths. The Mining Act makes this practice illegal, but where a fatality follows, the man responsible for it is generally the one who is killed. Contractors are very often guilty of this breach of the Act.

Miscellaneous Accidents Underground

Two persons lost their lives through being asphyxiated with gases emanating from the explosion of dynamite. The men were exposed to the gases from fifteen to twenty minutes only, but, although they lived for a few hours after being brought out of the mine, the doctors were unable to resuscitate them. At one of the inquests the physician gave evidence that he considered the death was caused by carbon-monoxide poisoning. This would indicate a lack of oxydizing agent in the dynamite, causing an incomplete combustion.

Accidents on Surface

There were 13 fatalities on the surface in 1909, compared with 8 in 1908, an increase of 5. Four resulted from explosion of powder, 2 from explosion of settler in smelter, 2 from being run down by train, and the others were due to miscellaneous causes.

These accidents are all described in another part of this report, but two of the accidents require additional comment. One of the fatalities was the result of thawing dynamite in a can over an open fire. The dynamite naturally exploded, killing one man and injuring another, although not seriously. This accident occurred at a prospect, and one of the men injured was in charge of the work. As long as foolhardy methods of thawing explosives such as mentioned above are used, we may expect to have accidents. Explosives are treacherous in their behaviour, and consequently need to be handled very carefully.

Another accident occurred in blasting out the salamander in the bottom of a blast furnace. The salamander was so hot that it caused the powder to smoke when placed on it. An iron pipe was used to put the dynamite in, as a protection. However, the charge exploded prematurely, killing one man. The Mining Act at the time of the accident prohibited the use of explosives in hot or heated ore. This provision did not apply in the above case, and an amendment was passed at the last session of the Legislature which makes the law to read as follows: "No powder, dynamite or other explosive shall be used to blast or break up ore, salamander or other material, where by reason of the heated condition of the ore, salamander or other material there is any danger or risk of premature explosion of the charge."

General Health of Miners

During the late summer and the fall of 1909 a bad epidemic of typhoid fever broke out in Cobalt and spread to the mines in the vicinity of the town. The Red Cross hospital, which is the hospital for the mines, was taxed to its utmost, necessitating a large staff of nurses and the use of hospital tents, but handled the large number of patients in an excellent manner. There was also much typhoid in the other silver-mining camps, and indeed in northern Ontario generally. The contamination of the drinking water was the chief source of the disease. It is necessary that pure drinking water should be supplied the men underground as well as on the surface. The use of portable privies in such shallow workings as those at Cobalt has some points of advantage, but more of disadvantage. Supplying pure drinking water and strictly enforcing the rule against contamination of the underground workings are the best safeguards for the health of the workmen.

Mines Hospital at Cobalt

The Red Cross hospital at Cobalt, to which nearly all the mines subscribed during 1909, has been taken over by a company known as The Cobalt Mines Hospital, Limited. Each of the mining companies is expected to subscribe for a number of shares of stock *pro rata* with the number of men it employs. The latter are then assessed 50 cents per man per month for the support of the hospital, for which they receive full hospital privileges in case of injury or illness. No profit is to be made by the hospital company, and any surplus is to be devoted to improvements or reduction of fees. During the epidemic of last year a large debt was incurred, which had to be met by the mining companies. At the height of the epidemic more than 200 patients were being cared for by the hospital, besides looking after a number of patients throughout the town.

The fatal accidents that occurred during the year are described in detail, after which is given a table of fatal and non-fatal accidents.

Algoma Steel Company

At the blast furnace of the Algoma Steel Company, Sault Ste. Marie, on October 6th, 1909, Henry Foster was killed by an explosion of dynamite while blasting hot salamander. The furnace had been blown out and, after it had become sufficiently cool for

men to work in it, the loose material, consisting chiefly of slag, was removed by pick and shovel. When the salamander was reached it was found too hot to be handled by this means. Accordingly an explosive was used to break it up. Work by drill and blasting had been in progress for about three days. Very little headway was made by hand, on account of the hardness of the material. The deceased had been employed by the company for about four years. During that time he had been engaged in various kinds of work, but never in handling explosives. Prior to the accident he had been employed on the scale car. The foreman, Mr. D. Rinker, had instructed Foster when blasting in the hot salamander to take an inch-and-one-quarter iron pipe about 18 inches to 2 feet in length, and put the explosive in it to protect it from the heat of the material. The hole that exploded prematurely was loaded in this manner. Kenneth Keith was in the furnace with Foster while the hole was being loaded, and stated that before Foster had completed the loading of the hole the dynamite began to smoke and water was thrown on it to keep it from catching fire. Keith took alarm and climbed out of the furnace. He had just got out when the explosion occurred. Immediately after the explosion Foster was seen to climb out of the furnace and was helped by Keith. Blood was pouring from a wound in his neck. He expired a few minutes afterwards, death being due to a severing of the jugular vein.

The coroner's jury returned the following verdict: "Henry Foster came to his death through an accident caused by a premature explosion of dynamite, the cause of the explosion being unknown to us."

Badger Silver Mine

At the Badger silver mine on June 22nd, 1909, Henry Davis, teamster, was killed by being caught between the cage and the shaft timber. Davis was waiting at the shaft house for a load of rock, when he volunteered to help the deck man fasten the hood. The cage was resting on the chairs at the surface and Davis climbed up on the timber, in order to bolt the hood together. It was found that, owing to the cage resting altogether on the chairs, the hood was jammed on the bar so that it could not be fastened. The cage tender had, accordingly, to signal the engineer to raise the cage. He first asked the deceased if he was clear of it, and he replied by saying he had lots of room. The cage was hoisted, but the engineer stopped it when he felt something catching. The deck hand saw that Davis had been caught between the cage and the timber and rang the cage down, when Davis fell to the floor quite dead.

The coroner's jury brought in the following verdict: "That Henry Davis was accidentally killed at the Badger mine on June 22nd, 1909, by being jammed between the cage and timber in the shaft house."

Big Six Silver Mine

At the Big Six silver mine, owned by the Big Six Mines, Limited, on October 5th, 1909, D. H. McGillivray, machine runner, was caught by an explosion while lighting a round of holes in the shaft.

Two machines were working in the shaft. A round had been drilled and McGillivray and another machine man stayed in the shaft to light a round of holes, each having three holes to light. The evidence of McGillivray's helper showed that he had not put tamping in any of the holes. Just as both men finished lighting the holes they stepped on the bucket and rang the signal to hoist. About the same time the powder in one of the holes that McGillivray had loaded began to burn and, when the bucket was about 15 feet from the bottom, there was an explosion and McGillivray was knocked off the bucket, the other man being hoisted safely to the surface. There was no time to go down the shaft after McGillivray before the rest of the holes exploded. He was found, when they were able to get into the shaft, partially buried in the loose rock and quite dead.

The explosion was caused by McGillivray failing to put any tamping on the powder in the hole, which was ignited by one of the fuses spitting into the hole after it was lighted.

Bruce Mines

At the Bruce Mines on July 22nd, 1909, Gus Matilla, timberman, was killed by being caught between the cage and the timber. Matilla had been employed at the Bruce Mines for only a few days as timberman. On the day of the accident he was working on the fourth level cutting hitches for stulls. About 4.30 p.m. he came to the station with some moils, which he put on the cage, and got on himself to go to the surface. J. Lapham rang up the cage. After the cage had got about half way between the third and fourth levels the men on the fourth level heard a shout from the deceased, calling to stop the cage. They at once rang one bell, the signal to stop. Almost immediately they saw the deceased fall down the shaft into the sump. He was picked up and taken to the surface, but was dead before he arrived there. It was found that his back was broken and his spinal cord severed.

Canadian Copper Company

Crean Hill Mine

At the Crean Hill mine on January 19th, 1909, Edward Salmet, machine runner, was killed through inserting an iron blow-pipe into a missed hole, causing an explosion.

From the evidence it appears that the deceased had found a drill hole near the place where he was drilling. In order to take advantage of this hole he had taken an iron blow-pipe and commenced to blow out the hole. Some of the men near him warned him not to do so. He persisted, and an explosion resulted, causing his death.

The coroner's jury returned the following verdict: "That Edward Salmet came to his death on January 19th about 11.40 p.m., on the fifth level of the Crean Hill mine, through carelessness on his own part in blowing out a missed hole."

At Crean Hill, on April 15th, Kalli Jarvis, machine helper, was killed by being struck on the head with a piece of falling rock while working on No. 1 stope of the third level.

On the above date, Kalli Jarvis and Aksil Jansen, machine runner, were set to work in the stope. This was the first shift they had worked here, as they had been scaling down the side of the stope until about 9.30 a.m. They set up the machine and began drilling. At about 11.45 a.m. Jansen was struck on the head by a piece of falling rock and knocked off the machine. He could not find his partner and went up to tell the shift boss. They returned together, and found Jarvis lying on his face about 6 feet from the machine, quite dead.

The evidence of the men and of Mr. H. C. Meek, mine superintendent, showed that 3½ shifts had been spent, on the 29th, 30th and 31st March, scaling this particular part of the stope, and that two men had been employed five hours on Saturday, April 10th, scaling the foot wall of this stope, but no scaling had been done since March 31st on the roof or the wall of the stope under which Jarvis and Jansen were working.

The coroner's jury returned the following verdict: "We find that the deceased came to his death by being struck on the head by a piece of falling ground while at work at the Crean Hill mine on April 15th."

At the same mine, on June 22nd, 1909, Mike Bekic, trammer, was struck on the head by a piece of falling rock while working in the first level of the mine.

The wall, near which the deceased was working, had been scaled that morning, but shortly after a large mass of ore fell from a height of about 20 feet. A small piece of the flying rock struck Bekic on the head, from which injuries he died a couple of hours later.

An inquest was held and a verdict of accidental death returned.

Koski Johnson and Dominic Dalc were killed at the Crean Hill mine by an explosion on December 15th, 1909. The accident occurred on the second level of the mine, which is now being worked as an open stope, part of the floor of the first level having been broken down. Koski Johnson was a machine helper, but on the day of the accident, his partner being ill, he was put on to run the drill. Dominic Dalc was engaged in running a hammer drill about 20 feet from the place where the accident occurred. About 12 o'clock, Fred Luff, shift boss, blasted one hole which was 10 feet in length, using 10 sticks of No. 1 gelignite. He went back after the blast to examine the ground and found some rather loose. He put 6 sticks of gelignite behind the loose piece and blasted it. On coming on shift at 1 o'clock Johnson began to scale down the side of the pillar where the blasting had been done. He had scaled down the lower part with a short bar, and saw some loose ground higher up the side of the pillar. He took a long blow-pipe and pried down a piece about 200 pounds in weight. An explosion instantly followed, killing Johnson and Dalc and injuring James Capporici slightly about the face. The explosion must have been caused by the piece of rock which fell striking some gelignite.

The coroner's jury brought in a verdict of accidental death.

Creighton Mine

At the Creighton mine, owned by the Canadian Copper Company, on November 4th, 1909, Adanti Anabel, crusher man, was killed by an explosion of dynamite in the rock house.

About five minutes before the accident the powerman had prepared and delivered to the machine runner at the surface 180 sticks of dynamite, being in two bags, one containing 100 and the other 80 sticks. These bags were put in the skip by the machine man, a tag containing the word "dynamite" being attached to the bale of the skip, to show the skip tender on the third level that there was powder in it. When the skip arrived at the third level the skip tender got into the skip, took out the bag containing 100 sticks and then got out of the skip. At this time the shift boss, J. Caesar, came to the station and asked him if that was all the powder there was in the skip. The skip tender stated that it was, and took another look to make sure. A car of ore was then dumped in the skip and sent up. This was dumped automatically over the grizzly in the rock house into the crusher. An explosion immediately followed, killing Anabel and blowing the top off the rock house.

The coroner's jury returned the following verdict: "That Adanti Anabel came to his death through the explosion of a quantity of dynamite which exploded in the Creighton mine rock house, due to an oversight on the part of the skip tender in not removing the dynamite from the skip."

Smelting Works

On September 18th, at the smelter yards of the Canadian Copper Company, Mariphetto Giovanni was killed, by falling in front of a moving train.

The man had been employed for several months to clean up round the slag tracks at the rear of the smelter. The smelter locomotive was pushing a car over one of the tracks where Giovanni was working. He was seen to step in front of the car and, although warned by the trackmen, was struck down, the car passing over him.

The coroner's jury brought in the following verdict: "That Giovanni came to his death on September 18th, 1909, in the Canadian Copper Company's smelter yards, and the death was accidentally caused by the deceased's own carelessness."

At the ash dump near the smelter of the Canadian Copper Company on December 20th, 1909, John Slako, labourer, was found burnt to death. The deceased had gone to work on Sunday at noon and, with the rest of the shift, should have worked until the following morning at 7 o'clock, the change of shift making it necessary that each week one shift should work 18 hours. At about 3 o'clock in the afternoon the yard foreman put him at work cleaning out the ash pit. This is a short distance from the turn-table, and is

where the locomotives clear their fires at night before going into the round-house. The pit is cleaned out each day, the ashes being removed by the yard man to a dump probably 100 feet away. Slako was working alone, and was last seen about 6 o'clock on Sunday evening, when he was eating his supper near the slag elevator. The foreman changed at 6 o'clock, and the night foreman did not see anything of him. It is supposed that Slako after finishing his work must have gone to the ash dump, where it was warm, and after sitting down either fell asleep or was overcome by the gas from the burning ashes. He had been reclining on a plank, which was partially charred. The whole upper part of Slako's body was burnt.

The coroner's jury brought in the following verdict: "That John Slako came to his death on Monday morning, December 20th, by being burnt while lying in the hot ashes, being probably rendered unconscious by the gases emanating from the partly burnt ashes."

At the railway track of the Canadian Copper Company, on December 12th, 1909, J. Foley, brakeman, was run over and killed. W. Hickey, who was acting conductor on the train, stated that they were making up a load and had tried to make a coupling. Not succeeding in doing this, Foley had signalled for the engineer to go ahead and, on account of the track being downgrade at this point, a string of cars had followed. Foley had apparently stepped in to arrange the knuckle and had walked along between the cars for some little distance, when he was seen by Hickey to throw up his hands and fall. He was found lying diagonally across the main rail and the guard rail, with his face on the outside of the main rail. The front wheel of the hind truck was resting across his back.

The coroner's jury returned the following verdict: "That J. Foley came to his death through a train passing over his body, he having caught his foot in the gnard rail while endeavouring to make a coupling. The jury recommend that all guard rails, frogs and switches be properly protected by blocks."

City of Cobalt Silver Mine

An accident occurred at the City of Cobalt silver mine on February 2nd, by which William Stafford, machine helper, fell down the shaft from the second to the third level while attempting to get on the cage. The men were being hoisted out of the shaft a few minutes before 12 o'clock. Stafford was on the second level and, as the cage came from the bottom, the cage tender stopped it, when it was about 5 feet above the level. The cage tender then rang two bells and the cage was lowered to within 18 inches of the station level when, he states, he rang one bell and stopped the cage. He then threw up the guard and one man got on the cage. As Stafford tried to get on, the cage started, throwing him backwards. In falling he caught the edge of the cage and hung on until his head had reached the timber, when the cage was stopped by the cage tender. Stafford almost immediately lost his hold and fell to the bottom of the shaft, sustaining a fracture of the base of the skull, from which he died almost instantly.

An inquest was held and a verdict of accidental death was returned.

Cobalt Central Silver Mine

At the Cobalt Central silver mine, on September 22nd, Elinder Eliason was killed by being struck by the cage as he was passing under the hoistway.

On the morning of the accident the deceased, who had worked only one day in this mine, had had no work assigned to him, but had been told by the captain and the shift boss to stay at the level until a place could be got ready for him. He had been standing at the station for an hour or so, when one of the cars that the cage tender had taken off the cage left the rails. Eliason, who was standing on the opposite side of the shaft from that at which the car had gone off the rails, went round and helped the cage tender put the car on the track. When crossing back, instead of going round the shaft, the way he had come, he crawled under the guard rails and in the act of doing so the cage came down, crushing him under it.

The coroner's jury brought in a verdict "That Elinder Eliason came to his death on September 22nd by being caught under the cage, through his own carelessness, and crushed in the shaft of the Cobalt Central mine."

Cochrane Silver Mine

At the Cochrane silver mine on May 29th, 1909, at 11 a.m., Ranald McDougall and John McDougall were injured by drilling into powder in the bottom of a hole, from which accident Ranald McDougall died on June 10th.

The two men mentioned and two on the opposite shift had a contract for sinking this shaft. The opposite shift had mucked out and, when the McDougall brothers came on shift at 7 a.m. they found everything in good shape. The superintendent, Mr. Floyd Harman, made an examination about 9.30 a.m. and pronounced everything all right. There was little evidence to be obtained as to the cause of the accident. Neither of the men was aware that there was an old hole containing powder until the explosion occurred. The explosion must have been caused either by a cut-off hole, whereby a little dynamite was left in the bottom of the hole, or else by some of the dynamite failing to explode and the men drilling into it.

Crown Reserve Silver Mine

At No. 1 shaft of the Crown Reserve silver mine, on January 5th, 1909, John Shannon, mucker, picked into a piece of gelignite, while mucking in the shaft. The gelignite exploded, causing a fracture of the skull, from which he died on January 8th.

On Friday, January 1st, a round of holes was fired on the Silver Leaf side of the shaft, where the work of taking down the party wall was going on. The rock from the holes went into the shaft, and mucking was carried on here all day Saturday. On Monday morning, about 5 o'clock, a round of holes was fired in the drift from No. 2 to No. 1 shaft which broke through into the latter. From the two rounds, three blasts were reported missing. The men then mucked in No. 1 shaft all day Monday, Monday night and Tuesday until 11.20 a.m, when the accident occurred. A couple of pieces of gelignite had been found in the muck and the captain had warned the men to be careful and to look out for gelignite. However, John Shannon picked into a piece of it, which exploded, causing his death.

The coroner's jury returned the following verdict: "That John Shannon received certain injuries on Tuesday, the 5th day of January, 1909, by picking into unexploded gelignite while working in No. 1 shaft of the Crown Reserve mine, from which injuries the said John Shannon died on the 8th day of January. We recommend that all mines in general, and the Crown Reserve in particular, observe more closely in future the working conditions as presented by the Mines Act, especially as relating to reports of one shift boss to another in regard to missed holes."

At this mine, on July 4th, 1909, Frank Malone, pipe fitter, was overcome by gas, from the effects of which he died about an hour later.

The accident happened on the second level of the No. 1 shaft. Frank Malone and Fred Dyer were sent down to this level about 8.30 a.m. to repair the pump. The drift, run from the bottom of this shaft, was in 60 feet, and a round of holes was fired in this heading at 12 o'clock on Saturday night. No air was blown in here from the time the holes were fired until the two men went down the shaft, when they turned on the air on the first landing. Neither of the men noticed any gas until they got to the bottom of the shaft, but as soon as they began to work both Dyer and Malone were overcome. The men on the first level noticed that something was wrong, and sent for assistance. Malone was the last man to be brought out, about 15 minutes after he went down. A doctor was in attendance shortly after he was brought to the surface, but it was impossible to resuscitate him.

The jury brought in a verdict of accidental death from gas poisoning.

At the same mine, on August 18th, 1909, J. Holland, machine helper, received injuries by being struck on the head with a piece of timber, which resulted in his death on September 15th.

On the day of the accident Holland, with his partner, was engaged in timbering the winze in the east cross-cut. He went to the surface to get some timber, and brought down four pieces, two of them four feet in length and two about nine to ten feet. When the cage with the timber got to the first level, Holland commenced to take off the timber, and was helped by the deck man. The two short pieces had been taken off, and they were engaged in taking off one of the long pieces, when the other piece toppled over on them, striking Holland on the back of the head and fracturing his skull.

The coroner's jury returned a verdict of accidental death.

Davis Silver Mine

At the Davis mine, which is situated on lot 4, in the third concession of Coleman, an accident occurred on January 6th, causing the death of Peter Peterson and injuring Mat Nearmee.

The shaft on this property was 65 feet deep, and was being sunk by hand, hoisting being done by hand whim and derrick. On the night of the accident the men had just gone down the shaft, when Peter Peterson came to the mouth of the shaft and called to the men below that he was going down the rope. He was told by one of the men below to take the ladder, but instead he started to slide down the rope. The rope, which was fastened to the drum of the whim, began to unwind and became loosened and Peterson fell to the bottom, striking and injuring Mat Nearmee, but not seriously. Peterson himself sustained a fracture of the neck and the base of the skull, resulting in instantaneous death.

The coroner's jury brought in the following verdict: "That Peter Peterson was instantly killed between eight and nine o'clock on Wednesday evening, the 7th day of January, at the Davis mine, through falling down the shaft. We recommend, for the safety of miners, that greater care should be taken with whims or other ways of hoisting when prospecting shafts are used, in the way of connecting the cable to such hoisting apparatus."

Deloro Mining and Reduction Company

At the smelter owned by the Deloro Mining and Reduction Company, Deloro, on December 10th, Huski Bokki was killed through being caught in an elevator. Bokki was employed as a laborer on the roasting floor of the smelter. Another employee was engaged in taking the roasted ore in a wheelbarrow to the floor above, using a slowly-moving elevator for hoisting it up. He had put the wheelbarrow on the elevator, stepped on himself, and started it moving. When it reached a height of about five feet he felt it stop, and saw that Bokki's head was caught between the elevator and the first floor. He lowered the elevator and released the man, but it was found that his neck was broken.

Through an oversight on the part of the coroner no inquest was held on this accident.

Elgin Cobalt Silver Mine

An accident occurred on March 30th, 1909, on a prospect shaft located on the northeast quarter of the north half of lot 3, in the twelfth concession of the township of Lorrain, owned by the Elgin Cobalt Development Company, which accident resulted in the death of John P. Bailey. Bailey was working alone in this shaft, which was about 12 feet deep, and had apparently lighted some holes in the shaft and began to climb out, when he was caught by the blast. He was found the next day by some lumbermen, with whom he had been staying. The deceased was lying in the bottom of the shaft, very badly cut up and quite dead.

The coroner's jury returned the following verdict: "That John P. Bailey came to his death on Tuesday, 30th day of March, 1909, while working in a shaft situated on the northeast quarter of the north half of lot 3, concession 12, township of Lorrain, accidentally from an explosion of dynamite."

Farah Silver Mine

At the Farah mine,on September 17th, Euclide Vicente was killed by falling down the shaft from the bucket, while partially overcome by powder fumes.

On the afternoon of the day of the accident the deceased and his partner fired a round of nine holes in the short drift of the 150-foot level. About two minutes after the blast they went down to the 100-foot level, where they started their drill in the heading of the drift, about 70 feet from the shaft. They remained down about twenty-five minutes, when the hoistman got one bell to hoist. He hoisted slowly, and, when the bucket was about twenty feet above the level, he got one bell to stop. The deckman noticed that something was wrong, and told him to hoist to the surface slowly. When the bucket reached the surface the partner of the deceased was found hanging over the side of it, quite unconscious. He was taken up, and revived some time after. Two of the men then went to the 150-foot level, where they found Vicente dead, his skull having been very badly fractured. The deceased was in the employ of Damos Gauthier, who had the contract for the work being done at this shaft.

Gowganda United Silver Mine

An accident occurred on claim M.R. 1961, owned by the Gowganda United Mines, Limited, on March 21st, 1909, causing the death of Thos. Douglas and injuring Amos Dummett. The men were employed on a prospect, the work being in charge of Amos Dummett. As far as could be learned, Douglas and Dummett were in the building used as a blacksmith shop, thawing dynamite over the fire in a can. An explosion occurred, causing serious injuries to Douglas, which resulted in his death a month later.

No inquest was held on this accident on account of there being no coroner at Gowganda at the time, and the impossibility of one going in at that season of the year.

Helen Iron Mine

At the Helen iron mine, on September 9th, Jaakop Korkiamaki and Granz Mannila were killed by a fall of ground in No. 5 stope on the fifth level.

On the day of the accident the two men mentioned drilled one hole during the forenoon and fired it when going off shift. After noon they both went into the stope, and after apparently doing but little scaling they set up their machine and started to drill. About 2.45 p.m. a mass of ore, weighing approximately 50 tons, fell, crushing both men under it. On examination of the stope it was found that there was a soft slip on the side, from which the ore fell, above which was loose ground composed of soft granular pyrite and calcite. This slip was the main cause of the accident. The hole fired by the men when going off shift had taken away the support for this mass of ore.

The coroner's jury returned the following verdict: "That Jaakop Korkiamaki and Granz Mannila came to their death by a fall of ground from the wall of stope No. 5, but there was no evidence of culpable negligence on the part of any employee of the Helen mine. The manner of their deaths was accidental."

James Mine

At the James mine, situated on lot 24, in the eleventh concession of Madoc township, Hastings county, an accident occurred on March 5th, 1909, resulting in the death of Daniel Phillips and Felix Allard and injuries to George Young and John Moore.

This property is owned by the James Company, Limited, of which Mr. W. A. Hungerford, of Madoc, was resident manager. At the time of the accident the work was being done by Robert Phillips, who had a contract for sinking a shaft from a depth of 20 feet to a depth of 70 feet. Mr. Phillips employed his own men, and was paid every two weeks for the amount of sinking he had done.

On March 4th, five holes, which had been drilled in the shaft by hand, were blasted about noon, giving five reports. After the round, Robert Phillips, contractor, went into the shaft to examine the ground and see if everything was safe. During the rest of this

day the men were engaged in mucking out the shaft. On the morning of March 5th Phillips went down in the shaft with the four men mentioned above, and pointed out two holes for them to drill. He went to the surface and came down into the shaft again about nine o'clock, just as the explosion occurred, with the result mentioned above. On examination it was found that two of the men had completed the hole that had been pointed out to them, and had begun to drill another one, which was the old bottom of one of the holes fired the previous day. It appears that there had been a slip about three or four inches above the bottom of the hole, and the top part had been cut off, leaving the powder in this hole.

The coroner's jury returned the following verdict: "That Daniel Phillips came to his death on Friday, March 5th, 1909, in the shaft of the mine owned under option by the James Mining Company. We also found his death was caused by an accidental explosion, and no blame can be attached to anyone connected with the said mine. We also further recommend that a regulation be added to the Mining Act prohibiting the drilling in an old hole."

Laurentian Gold Mine

At the Laurentian gold mine, on April 26th, Jacob Nyman, machine runner, was killed while loading a hole with gelignite. It appears that Isaac Nyman, who was about twelve feet from the deceased, after taking the paper off the gelignite, had handed the deceased two sticks of gelignite, one of which the deceased put in the hole. This stuck about 4½ feet from the collar of the hole, and the deceased was trying to push it to the bottom when the explosion occurred. The hole was about seven feet deep.

The evidence of the helper showed that when drilling the hole they had difficulty with it when about this depth, which would probably account for the trouble the deceased had in getting the stick to the bottom of the hole. The superintendent stated that he had always found Jacob Nyman a careful, hard-working and efficient miner. The accident must have been caused by the gelignite sticking in the drill hole, which was probably a little rough at this point, and by the deceased, Jacob Nyman, using too much force in trying to get it to the bottom of the hole.

The coroner's jury returned a verdict of accidental death.

Mayo Iron Mine

At the Mayo iron mine, operated by the Canada Iron Corporation, on December 15th, 1909, Pasquali Maiurino, mucker, was killed by being crushed under a large piece of falling ore. The deceased was an Italian, engaged as a mucker on the second level. A round of holes had been fired in the side of the winze about twelve o'clock. At one o'clock the men came on shift. The machine men scaled down where they were underhand stoping, and three of the muckers did some scaling on the second level under the ground where the blast had taken place. After these three men had scaled for about half an hour they began to muck. About half an hour afterwards a piece of ground, weighing about 300 pounds, fell, striking Maiurino and injuring him so seriously that he died a few hours later.

The coroner's jury returned the following verdict: "That Pasquali Maiurino came to his death on the 15th day of December, in the drift in Mayo mine No. 4, operated by the Canada Iron Corporation under lease from the Mineral Range Iron Mining Company. His death was caused by a large piece of ore accidentally falling from the roof of the drift and hitting him."

McKinley-Darragh Silver Mine

At the McKinley-Darragh mine, on March 17th, 1909, Robert Johnson, machine runner, was killed while loading a hole with gelignite. On the night of the accident Johnson, who had drilled four holes with an air hammer drill, about 11.30 went to the powder house to get a supply of powder to load seven holes, three of which had been drilled by the opposite shift. He was seen coming up with the powder about fifteen minutes before the accident occurred. The machine man and helper working in the drift

near the deceased heard a shot, and concluded that the deceased was firing a round. No notice was taken until at supper the shift boss noticed that the man was missing, and, going down, found him in the stope covered with rock and quite dead. On examination of the back where he had been working, it was found that he had loaded four holes, and was apparently loading the fifth when the explosion occurred. On account of the position of the hole, which was in the back of the stope nearly vertical, it was impossible to arrive at any satisfactory explanation of the cause of the accident. The deceased was apparently pushing the gelignite into the hole with a wooden tamping stick when the explosion occurred. It would therefore appear that the explosion was caused by the friction between the rock and the gelignite while putting it into the hole.

The coroner's jury returned the following verdict: "That Robert Johnson came to his death on Wednesday, 17th day of March, 1909, in the stope of the McKinley-Darragh mine, and that the cause of the death of the said Robert Johnson was an accidental explosion of gelignite."

At the same mine, on April 24th, 1909, George Watson, otherwise known by the name of Geo. W. Puckett, machine runner, was killed by an explosion in the raise in which he was working.

A round of holes had been fired in this raise on Saturday morning, and three holes were reported missing. On Saturday morning the shift boss gave instructions to have these three missed holes fired at twelve o'clock. These were fired along with another, and one reported short. On Saturday night Watson started to work, and about an hour after an explosion occurred. It would seem that the deceased had begun to drill in one of the old bottoms, which happened to be a missed hole, thus causing the explosion.

The coroner's jury brought in the following verdict: "That George Watson or George W. Puckett came to his death at the McKinley-Darragh mine by an explosion caused by lack of method in ascertaining missed holes, and we recommend that there be more stringent reports made by one shift boss to another, and that fully experienced men be engaged as shift bosses and captains."

On December 1st, 1909, Costea Ruciarz, mucker, was instantly killed by picking into a piece of gelignite in the muck. The accident occurred about 3.30 p.m., in a drift at the 75-foot level of No. 1 shaft. About two days prior to the accident a cut-off hole had been discovered in the cross-cut, which was only about six feet in length. This cut-off hole was fired as soon as found, but a couple of sticks of gelignite must have been left in the muck. About twenty minutes before the explosion the deceased's partner found a piece of gelignite in the muck and laid it to one side. Just a few seconds before the accident Ruciarz was seen picking in the muck, and must have struck another piece of gelignite, which exploded.

The coroner's jury returned the following verdict: "That Costea Ruciarz came to his death by an explosion of powder in the muck, and the death was accidental. The jury recommend that definite instructions be given to muckers to have all powder found by them conveyed to some safe place."

Moose Mountain Iron Mine

At the Moose Mountain iron mine, on December 30th, 1909, J. Depilon was killed while walking over a pit where a blast had been lighted. The men were engaged in blasting out rock for a foundation. The fuse was lighted, and the captain and the powder man shouted "fire," and all ran to a place of safety. It would seem that at this time Depilon came to the place of blasting from a distant point where construction work was also being carried on, and evidently had not heard the cry of "fire." He was crossing an 18-inch plank over the pit, when the blast went off. Depilon was thrown into the air, and lighted on his head in the pit, a fall of eight or ten feet. He was taken to the hospital at Sudbury, but died a few minutes after reaching there.

The coroner's jury brought in a verdict "That J. Depilon was accidentally killed, and that there could be no blame attached to anyone."

Northland Pyrites Mine

At the Northland pyrites mine, on March 5th, 1909, Aleck Hebrik, machine runner, was instantly killed by falling through timbers into the stope below. Four men were employed in blasting in the north stope of the 100-foot level. The stope was being carried as an underhand stope from the level, and the floor of the level had been timbered across to protect the men, and also to afford access to the far end of the stope. Immediately after the blast Hebrik started to walk across this timber. Some of the men warned him not to do so, as the smoke from the blast was so thick that it was impossible to see in front of him. He, however, continued across the timber until he came to a place where the blast had cut away a stull, leaving a hole in the timber. On account of the smoke Hebrik could not see the hole, and fell into it, being killed instantly.

The coroner's jury returned the following verdict: "That Aleck Hebrik came to his death on the 5th day of March, 1909, about 11.45 p.m., and such death was accidental."

Mond Nickel Company

Victoria Mines

At the smelter at Victoria mines, operated by the Mond Nickel Company, on September 12th, 1909, Fred Guran and John Bezmutke were killed by the explosion of the settler of No. 1 furnace. This settler was about 12 feet in diameter and about 4 feet high, with 12 inches of lining composed of magnesia, brick, clay and quartz. About five minutes before the accident occurred a ladle full of matte had been tapped off, which left the settler about half full of matte and slag. The night foreman and the tapper were standing alongside the settler when they heard a slight explosion. They immediately called to the three men, who were eating their lunch nearby, to go to a place of safety. A few seconds afterwards a very violent explosion occurred, throwing down the walls of the settler and covering the two men, Guran and Bezmutke, with matte and slag, from which burns they died a few hours afterwards.

The coroner's jury brought in the following verdict: "That Fred Guran and John Bezmutke came to their death as the result of an explosion which was accidentally caused by a defective settler."

Garson Mine

On September 17th, 1909, at the Garson nickel mine, owned by the Mond Nickel Company, Wm. Scott, cage tender, was killed by falling down the shaft.

Scott had attempted, with the assistance of two other men, to right a misplaced car on the cage at the first level, and had climbed over the car to the rear of the cage to lift it. Before all was clear, someone unknown, rang the regulation hoisting signal. Feeling the cage moving, Scott attempted to step off on a timber, missed his footing, and fell to the fifth level. He was killed instantly.

The coroner's jury brought in the following verdict: "That Wm. Scott came to his death from accidental causes. No blame can be attached to any employees of the company."

Nipissing Silver Mine

At the Nipissing silver mine, on May 25th, 1909, John Pirttinen, timberman's helper, was killed by falling from the bucket down the shaft.

Deceased and John Olliakinen, timberman, had been timbering the shaft on the 200-foot level. At about 8.30 a.m., noticing a little gas, they came up to the first level, and remained there about half an hour. After going back to the second level they took out the hanging rods of the station set, put them in the bucket, and then both men got on the bucket and rode to within two feet of the platform of the first level. Some of the rods being 16 feet long, the bucket was stopped below the first level, as the hoist man was afraid of the rods catching in the sheave wheel. When the bucket was stopped the timberman got out, and was looking up to see if the bucket could be hoisted any higher

without the rods catching, when he noticed his partner falling out of the bucket into the shaft. It was supposed that the deceased had started to get out of the bucket, but in so doing slipped and fell backwards into the shaft.

The coroner's jury brought in the following verdict: "That John Pirttinen came to his death on Tuesday, 25th May, 1909, at the Fourth of July shaft of the Nipissing mine, by accidentally falling out of the bucket."

At the same mine, on June 15th, 1909, Alerio Marinelli, laborer, was killed in a trench through being struck by a boulder. The trench in which the deceased was working was about eleven feet deep, the upper four and a half feet being of peat, and the lower six and a half feet very hard dry clay, with a number of boulders through it. A boulder, weighing from 300 to 400 pounds, which protruded about eight inches into the trench at a distance of about three and a half feet from the bottom, fell out, striking the deceased on the side and knocking him over against the other side of the trench, his head coming in contact with a small boulder, also imbedded in the clay. The fall of the large boulder loosened a lump of clay above, weighing about 150 pounds, which descending struck Marinelli on the head and fractured his skull. He was taken to the Red Cross hospital, and died five hours later.

On November 30th, 1909, Alfred Silvola, machine runner, was instantly killed while loading a round of holes in a raise at the Fourth of July shaft. While loading the holes the dynamite, in some manner unable to be determined, caught fire and exploded, killing Silvola instantly. Allan Carswell and Wm. Kokka were in the shaft about thirty feet below, and were slightly injured. These two men gave evidence that some burning powder had dropped down from the raise a few seconds before the accident, and that the raise was flooded with light from the burning powder.

The coroner's jury brought in a verdict of accidental death.

Nova Scotia Silver Mine

At the Nova Scotia mine, on July 8th, 1909, Samuel Chislett, machine runner, was killed by being caught between the cage and the timber in the shaft.

Chislett was running a drill in a drift about fifty feet from the shaft on the fifth level. About ten minutes before the accident he went out of the drift to the station, about ten feet from the shaft, to talk to Grant Dempster, boss carpenter. Dempster got on the cage and told S. Clarke, carpenter, to get on with him and go to the next level. After Clarke had got on, Dempster rang the cage to the fourth level. The cage was not raised for about thirty seconds, and during this interval of time Chislett, who had made no mention of wanting to go to the surface, made a run for the cage. Dempster called to him to go back, but he paid no attention and tried to climb on under the bar just about the time the cage started. He got about half on when the cage got to the top of the station set, where he was caught between the timber of the station set and the cage. The latter was stopped and lowered, and it was found that Chislett was very seriously injured about the hips and legs. He was taken to the hospital, and died about 12.15 a.m. on July 9th.

The coroner's jury brought in a verdict of accidental death.

On February 12th, Napoleon Tayer, laborer, was killed by the falling of frozen rock, under which he was working, at the dump of the Nova Scotia mine. The deceased was employed by C. F. Price, contractor, who had a contract for hauling rock from the Nova Scotia dump to the Northern Customs Concentrator. The deceased had been warned the day before by contractor Price not to work under the frozen ground, but he persisted in doing so, and as a result lost his life.

The coroner's jury brought in the following verdict: "We find that the deceased, N. Tayer, met his death at the Nova Scotia mine dump by rock accidentally falling upon him on February 12th, 1909."

O'Brien Silver Mine

At the O'Brien silver mine, on April 2nd, 1909, Herbert Cooper, machine helper, came to his death from inhaling poisonous gases after firing a round of holes with a new variety of dynamite manufactured by the Northern Explosives Company, Limited.

The deceased was working in a cross-cut in No. 1 shaft. At twelve o'clock he and his partner fired a round of holes, using 66 sticks of powder. At one o'clock the deceased went into the heading with Howard, machine man. Howard came out in about five or ten minutes suffering from the effects of gas. The shift boss went in the cross-cut and found Cooper unconscious. He was brought out and taken to the surface, and thence to the hospital. There he lingered in an unconscious condition for about five hours, resisting all the efforts of the doctors to bring him round, and died about six o'clock. The doctor stated that he was of the opinion that carbon monoxide was the predominating constituent of the gas that caused the death.

The coroner's jury returned the following verdict: "That Herbert Cooper was overcome by gas in the O'Brien mine and died from the effects of it about six o'clock on the same day. The death of the said Herbert Cooper was accidental, and no blame can be attached to the company or to any of the officials."

At the same mine, on May 4th, Joseph Scott, machine helper, was killed by slipping from the bucket and falling from the first to the second level.

At 7 a.m. Scott, with Richard McCandie and John Ross, got on the bucket at the collar of No. 2 shaft to ride to the first level. McCandie and Ross were in the bucket, and the deceased was standing on the cross-head. When the bucket reached the level the engineer stopped it, and McCandie and Ross got out. Scott climbed down from the cross-head to the rim of the bucket, and, in getting from the bucket to the station platform, he slipped and fell to the second level, a distance of 100 feet. He was picked up and found to be in a partially unconscious condition. He was moved to the hospital, where it was found that the thorax and ribs on the right side were broken. He died at about 9.45 a.m.

An information was laid before Magistrate Atkinson against Richard McCandie and John Ross for violation of section 164, rule 23, of the Mining Act of Ontario. The case was heard at Cobalt on Tuesday, May 11th, at 3 p.m. The men pleaded guilty, and were each fined $10.00 and costs.

Rochester Silver Mine

At the Rochester silver mine, on December 29th, 1909, Ernest Edward Burley, machine runner, was killed by an explosion while firing a round of holes in the cross-cut from the main drift about 125 feet west of the shaft on the first level. The deceased, helped by his brother, Wm. Burley, had loaded a round of eight holes and fired them about 11.30 p.m. They had mucked back, and found that about two feet of each hole was left. They then reloaded the holes, putting about two sticks of explosive in each, and Burley was in the act of firing these holes when an explosion took place which injured him fatally, his death occurring about seven hours later. Before Burley died he said that in lighting the holes he was caught by a "quick fuse." There was no evidence, however, to support the injured man's contention, nor was there any evidence to show that the holes were tamped after being loaded, and from the evidence of Wm. Burley it was shown that in some of the holes the powder came within three inches of the collar of the hole. The fuse was manufactured by Bennett & Sons, and was in good condition. The powder used was manufactured by the Northern Explosives Company. From comparison with some similar accidents that have occurred in Ontario, it would appear that the explosion was caused by the fuse of one of the holes after it was lighted, spitting into the powder of another hole which had not been tamped.

The coroner's jury brought in the following verdict: "That Edward Burley came to his death on December 29th, at the Rochester mine, by the premature burning of a fuse

which caused the dynamite to explode too quickly, and we accordingly find a verdict of accidental death. We strongly recommend that the Federal Government enact a law compelling the inspection of all explosives, fuse and caps."

Sulphide Pyrites Mine

At the Sulphide pyrites mine, owned by the Nicholls Chemical Company, on July 5th, 1909, Percy Davey, machine runner, was killed by a premature blast in the winze.

A round of nine holes had been drilled in this winze, which was 20 feet deep, during the day shift, and when Davey and his partner came to work they proceeded to load the round. The helper stated that the nine holes were loaded with four sticks each of 40 per cent. dynamite, and that in loading the holes the deceased did not use any tamping in eight of them. After the nine holes had been loaded, his helper was sent to the top of the winze, and Davey proceeded to light the holes. The helper saw him start to light the round, when an explosion instantly occurred. On examining the winze after the accident it was found that all the holes had exploded except one. It would appear that the fuse, after being lighted, had spit in one of the untamped holes, causing a premature explosion.

The coroner's jury brought in a verdict of accidental death.

Temiskaming Silver Mine

At the Temiskaming silver mine, on March 3rd, 1909, Ainslie Patriquin was instantly killed while mucking out the shaft subsequent to blasting. A round of holes had been fired and all reports received, but Patriquin, while mucking, struck his shovel against some unexploded gelignite, which exploded. Patriquin had been in the employ of the company for a year, and was said to be an experienced miner.

An inquest was held, and a verdict of accidental death returned.

At the same mine, on August 6th, 1909, Frank Crean, machine man, was killed by being struck on the head with a rock falling from the bucket while engaged in sinking the shaft.

Four men, namely, Ben Lewis, A. J. McNeill, B. Barnes and William Stephenson, had a contract for sinking No. 2 shaft from the 300-foot level, a depth of 50 feet. On the night of the accident the deceased was working in the shaft with Ben Lewis and A. J. McNeill. A round of holes had been fired on the previous shift, and the men were engaged up to the time of the accident in mucking out the shaft. The shaft contained two hoisting compartments and a ladderway, the north hoisting compartment being used at this time exclusively for sinking the shaft. A pentice had been put in under the hoistway and the ladderway at the 250-foot level. This pentice protected the men in the shaft from anything falling down the ladderway or the south hoisting compartment, and covered two-thirds of the shaft. The north hoisting compartment was for the bucket used in mucking out the shaft. At the time of the accident four men were engaged shovelling into the bucket, two of them being under the bucket way and two of them protected by the pentice. The bucket had been loaded, and, in going to the surface, a piece of rock fell out. It fell to the bottom, striking Frank Crean on the head, killing him instantly. The shaft was provided with proper guides and cross-head.

The coroner's jury brought in a verdict "That Frank Crean was killed owing to defective gear in the shaft."

Table of Fatal Accidents in 1909

Date.	Name of Mine.	Name of Owner.	Name and Occupation of Injured.	Below ground.	Above ground.	Nature of Injury.	Cause of Accident.
Oct. 6..	Blast furnace	Algoma Steel Co	Henry Foster, labourer	....	1	Windpipe and jugular vein severed.....	Explosion, while blasting hot salamander in blast furnace.
June 22..	Badger	Badger Mines Co., Ltd	Henry Davis, teamster	....	1	Fracture of skull	Caught between cage and timbers of shaft house.
Oct. 15..	Big Six	Big Six Silver Mines, Ltd.	J. M. McGillivray, machine runner ..	1	....	Badly shattered	Caught by explosion while lighting holes in shaft.
July 22..	Bruce	The Bruce Mines, Ltd.....	Gus Matilla, machine runner	1	....	Back broken and spinal cord severed..	While ascending shaft on cage, caught between cage and timbers.
Jan. 19..	Crean Hill	Canadian Copper Co.....	Edward Salmet, machine runner.....	1	....	Killed instantly.....	Inserted iron blow-pipe into missed hole, causing explosion.
April 15..	do	do	Kalli Jarvis, machine helper	1	....	Skull fractured.....	Struck by piece of falling rock.
June 22..	do	do	Mike Bekic, trammer	1	....	Injury to head	Struck by piece of falling rock.
Sept. 18..	Smelter yards ..	do	Mariphetto Giovanni, labourer	....	1	Chest crushed, and internally injured.....	Run over by train.
Nov. 4..	Creighton	do	Adanti Anabel, crusher man	....	1	Fracture of base of skull	Bag of powder, sent down in skip, not taken out; car of ore dumped on it, and hoisted to rock house, where it exploded.
Dec. 12..	Railway track at Copper Cliff ..	do	J. Foley, brakeman	....	1	Badly crushed.....	While making a coupling, slipped and run over.
Dec. 15..	Crean Hill	do	Toski Johnson & Dom. Dalc, miners.	2	....	Injuries to head....	Explosion of gelignite, while barring down loose rock.
Dec. 20..	Smelter yards ..	do	John Slako, labourer	....	1	Burned to death.....	Lay down on cinder pile; was overcome by gas, and burned to death.
Feb. 2..	City of Cobalt ..	City of Cobalt M'g. Co.Ltd	William Stafford, machine helper....	1	....	ase of skull fractured	Fell down shaft, while attempting to get on cage in motion.
Sept. 22..	Cobalt Central ..	Standard Cobalt Mines Ltd	linder Eliason, machine helper....	1	....	Body crushed	Crushed under cage while crossing hoistway.
May 29..	Cochrane.....	Cochrane Cobalt M'g. Co	anald McDougall, machine runner.	1	....	Compound fracture of right leg, wounds in thigh & groin	Drilled into old hole containing dynamite.
Jan. 5..	Crown Reserve ..	Crown Reserve M'g.Co. Ltd	John Shannon, mucker	1	....	racture of skull	Picked into a piece of gelignite while mucking, which exploded.
July 4..	do ..	do	Frank Malone, pipe fitter	1	....	Asphyxiated	Overcome by gas from powder fumes.
Aug. 18..	do ..	do	J. Holland, machine helper	1	....	racture of base of skull	Timber fell off cage, striking him on back of head.
Jan. 6..	Davis	H. P. Davis, et al	Peter Peterson, miner.....	1	....	racture of neck and base of skull.	While sliding down rope into shaft, rope unwound off whim, allowing deceased to fall to bottom.
Dec. 10..	Smelter	DeloroMin.& ReductionCo	Huski Bakki, labourer	....	1	Neck broken	Caught in elevator.
Mar. 30..	N-E ¼ of N ½ lot 3, con. 12, Lorrain	Elgin Cobalt Dev't Co ..	John P. Bailey, miner.....	1	....	Badly cut about the head..	Found alone in prospect shaft, having apparently been caught by blast after lighting a round of holes, while climbing out of shaft.
Sept. 17..	Farah.....	Farah Mining Co., Ltd....	Euclide Vicente, machine helper....	1	....	Skull smashed	Fell from bucket while ascending shaft, when partially overcome by gas.
Mar. 21..	M.R. 1961.....	Gow Ganda United Mines, Ltd.	Thos. Douglas, miner.....	....	1	Badly cut in the groin, dying a month later.....	Thawing dynamite in can over fire.
Sept. 9..	Helen.....	Lake Superior Power Co ..	Jaakop Korkiamaki and Granz Mannila, miners.....	2	....	Compound fractures of skull..	Fall of ore.
Mar. 5..	James.....	James Co., Ltd.....	Dan. Phillips and Felix Allard, miners	2	....	Killed instantly.....	Drilled into bottom of old hole containing unexploded dynamite.
April 26..	Laurentian	Imperial Gold Mines, Ltd.	Jacob Hyman, machine runner	1	....	Skull fractured	Explosion while charging round of holes, preparatory to blasting.
Dec. 15..	Mayo	Canada Iron Corporation..	Pasquali Maiurino, mucker	1	....	Legs crushed	Fall of ore.
Mar. 17..	McKinley-Darragh.....	McKinley-Darragh-Savage Mines, Limited	Robt. Johnson, machine runner....	1	....	Killed Instantly	Premature explosion of gelignite while loading hole.
April 24..	do	do	Geo. W. Puckett, machine runner ..	1	....	Killed Instantly	Supposedly drilled into bottom of old hole containing unexploded powder.

Table of Fatal Accidents in 1909—Concluded.

Date.	Name of Mine.	Name of Owner.	Name and Occupation of Injured.	Below ground.	Above ground.	Nature of Injury.	Cause of Accident.
Dec. 1..	McKinley-Darragh....	McKinley-Darragh-Savage Mines, Limited.....	Costea Ruciarz, mucker.....	1	....	Head smashed.....	Picked into piece of gelignite in muck.
Dec. 30 ..	Moose Mountain.	Moose Mountain, Ltd.....	J. Depilon, labourer.....	....	1	Skull fractured.....	Walked over place where blast was being set off.
Mar. 5 ..	Northland	Northland M'g. Co.....	Alex. Hebrik, machine runner.	1	....	Killed instantly	Fell through hole in timbers after blast.
Sept. 12..	Smelter	Mond. Nickel Co.....	John Bezmutke and Fred Guran, labourers.....	....	2	Burned by molten matte	Explosion of settler of furnace.
Sept. 17..	Garson.....	do.	Wm. Scott, cage tender	1	....	Badly smashed	Fell down shaft.
May 25..	Nipissing.....	Nipissing M'g. Co.....	John Pirttinen, timberman's helper..	1	....	Skull fractured.....	Fell from bucket while attempting to get out at level.
June 15..	do.	do.	Alerio Marinelli, labourer.....	....	1	Fracture of skull.....	While working in trench struck by boulder which fell from side of trench.
Nov. 30..	do.	do.	Alfred Silvola, machine runner.....	1	....	Killed instantly.....	Premature explosion while loading round of holes.
July 8..	Nova Scotia.....	Nova Scotia Silver Cobalt Mining Co.....	Samuel Chislett, machine runner	1	....	Hips and legs crushed	Caught between cage and shaft timbers.
Feb. 12..	do	C. F. Price, Contractor....	Napoleon Tayer, labourer.....	....	1	Killed instantly..... ..	Fall of frozen rock on dump.
April 2..	O'Brien.....	M. J. O'Brien.....	Herbert Cooper, machine helper.....	1	...	Asphyxiated	Overcome by dynamite fumes.
May 4..	do.	do.	Joseph Scott, machine helper.....	1	....	Thorax and ribs broken.....	Fell from bucket down shaft 75 feet.
Dec. 29..	Rochester.....	Rochester Cobalt Mines, Ltd.....	E. Burley, machine runner.....	1	....	Severely injured under left arm and side.....	Premature explosion.
July 5..	Sulphide.	Nicholls Chemical Co.....	Percy Davey, machine man.....	1	....	Skull fractured and body shattered	Explosion while lighting round of holes.
Mar. 3..	Temiskaming....	Temiskaming M'g. Co....	Ainslee Patriquin, machine man.....	1	....	Killed instantly.....	Picked into unexploded gelignite in muck.
Aug. 6..	do.	do.	Frank Crean, machine man.....	1	....	Skull fractured.....	Rock fell from bucket and struck deceased on head.
			Total.....	36	13		

Table of Non-Fatal Accidents in 1909

Date.	Name of Mine.	Name of Owner.	Name and Occupation of Injured.	Below ground.	Above ground.	Nature of Injury.	Cause of Accident.
May 29..	Cochrane	Cochrane Cobalt M'g Co...	John McDougall, machine runner....	1	....	Flesh wound about face.....	Drilling into old hole containing dynamite.
Feb. 17..	Coleman Dev't...	Coleman Dev't Co., Ltd...	Noble Farnam, machine helper.....	1	....	Face cut	Picked into gelatine dynamite in muck.
Dec. 15..	Crean Hill	Canadian Copper Co.....	J. Capporice, boss trammer	1	....	Face injured.....	Explosion of gelignite while barring down loose rock.
Jan. 5..	Crown Reserve...	Crown Reserve M'g Co....	S. Chapple, deckman.....	....	1	Wound in face.....	Struck by piece of steel he was taking off cage.
Nov. 29..	do ...	do	R. Vacha, carpenter	1	....	Sprained back	Steel plate fell on him from cage.
Dec. 21..	do ...	do ..	A. Griffin, machine runner.....	1	....	Lower jaw broken and eyesight injured.....	Picked into piece of gelignite in bottom of drift.
			E. Desmond, machine helper	1	....	Slight face injuries	
Jan. 6..	Davis	H. P. Davis, et al.....	Mat Nearmee, miner	1	....	Back and thighs bruised	Peter Peterson fell down shaft and struck him.
April 17..	Devlin	Devlin Mining Co., Ltd..	H. Miron, miner	1	....	Both legs broken.....	Drilled into bottom of old hole containing unexploded dynamite.
			P. Mercier, miner	1	....	Injuries to eyes	
			A. Mercier, miner.....	1	..	Both legs broken.....	
Mar. 21..	M. R. 1931	Gowganda United M's, Ltd	Amos Dummett, miner.....	....	1	Cuts on body	Thawing dynamite in can over fire.
Jan. 19..	Hargraves.....	Hargraves Silver M's. Ltd.	John Chenoweth, mine captain.....	1	....	Collar bone broken.....	While timbering in shaft staging gave way, precipitating him twenty-five feet.
July 5..	do	do	Wm. Woodworth, machine runner ...	1	....	Broken leg.....	Machine fell on his leg.
Jan. 6..	Helen Mine.....	Lake Superior Power Co...	Pietro Boni, miner	1	....	Scalp wounds and fractured knee cap.	Struck by piece of ore, which knocked him into raise and down to fourth level.
Jan. 9..	do	do ..	Steve Spostala, trammer.....	1	....	Scalp wound	Struck on head by piece of falling ore.
Jan. 13..	do	do ..	C. Agnese, trammer	1	....	Finger crushed.....	Caught finger in ore car when dumping it.
Jan. 22..	do	do ..	Emelis Boni, machine man.....	1	....	Finger crushed.....	Caught finger in drill.
Dec. 9..	do	do ..	A. Knuuttila, miner...	1	....	Face and hands cut and eyes injured.	Picked into dynamite in missed hole.
Aug. 21..	do	do ..	John Baltovin, machine runner	1	....	Fingers crushed.....	Fingers caught in machine.
May 22..	do	do ..	Jelviar Lake, machine runner	1	....	Injured in right side	Struck by piece of ore.
Nov. 3..	do	do ..	Wm. White, machine man	1	....	Sprained ankle	Struck by ore, causing him to fall down stope.
Mar. 5..	James.....	James Co., Ltd.....	Geo. Young, miner.....	1		Badly cut by flying rocks from explosion.....	Drilled into bottom of old hole containing dynamite.
Mar. 4..	Kerr Lake Majestic.	Kerr Lake Majestic M'g Co., Ltd.	John Moore, miner.....	1	..		
			Walter Olsen, miner.....	1	....	Head cut.....	Went back to shaft too soon after blast, and was injured by explosion.
Jan. 9..	La Rose.....	La Rose Mines, Ltd.....	Geo. Dion, miner.....	1	....	Leg broken	Loose rock fell on him from roof of drift.
April 11..	do	do	A. H. Derry, master mechanic.....	....	1	Leg broken	Fell on surface.
April 15..	do	do	Gideon Houle, miner	1	....	Lacerated hand	Hand caught between piece of falling rock and scaling bar.
July 28..	do.	do.	Martin Kudla, mucker	1	....	Back bruised.....	Rock rolled against him from side of drift.
Sept. 24..	do.	do.	John McCarty, miner.....	1	....	Bruised.....	Rock fell on him while scaling.
June 28..	Victoria.....	Mond Nickel Co.....	Chas. Hill, machine man.....	1	....	Scalp wound.....	Struck on head by piece of rock while working in shaft.
Nov. 30..	Millerett.....	Millerett Silver Mines.....	Thos. Girard, miner.....	1	....	Broken arms and flesh wounds	Fuse spit on powder in untamped hole.
June 23..	North Lanark Marble Quarry..	North Lanark Marble and Granite Quarry Co.	T. Sweeney, labourer...	....	1	Broken nose and scalp wound	Struck by crank of hand winch.
Nov. 30..	Nipissing	Nipissing M'g. Co.....	Wm. Kokka, Allan Carswell, machine men.	2	....	Scalp wounds.....	Cut by flying rock in explosion in which A. Silvola was killed.
June 10..	O'Brien.....	M. J. O'Brien.....	John Hipworth, machine helper.....	1	....	Loss of eyesight	Drilled into bottom of old hole which contained dynamite.
			Willis Fry, machine runner..... ..	1	....	Injury to abdomen..... ..	

Table of Non-Fatal Accidents in 1909—Concluded

Date.	Name of Mine.	Name of Owner.	Name and Occupation of Injured.	Below ground.	Above ground.	Nature of Injury.	Cause of Accident.
Jan.. 30..	Right of Way....	Right of Way M'g. Co....	Wm. Stemkiewicz, trammer.....	1	....	Leg broken.....	Struck by piece of rock, while rock was being scaled.
June 28..	Bruce.....	The Bruce Mines, Ltd..	A. Puskala, machine runner.....	1	...	Flesh wounds.....	Struck piece of unexploded gelignite with pick.
			Vic Ogi, machine helper.....	1	....	Flesh wounds and left eye destroyed.	
July 7..	do	do.	E. Lilius, machine runner.....	1	....	Injuries to face and eyes....	Struck an unexploded charge of gelignite with pick.
			E. Guigius, machine helper..... ...	1	....	Slight flesh wounds.....	
Oct. 27..	Trethewey.....	Trethewey Silver Cobalt Mines, Ltd.	S. Sawzick, mucker.....	1	....	Eyes injured, also face and hands.	Shovel struck loose dynamite in muck.
Nov. 4..	Temiskaming....	Temiskaming Mining Co. Ltd.	C. Davis, machine runner.....	1	....	Broken ankle.....	Before engineer was at hoist men got on cage, which descended shaft uncontrolled.
			W. White, machine runner.....	1	....	Sprained knee....	
Dec. 27..	do..	do.	R. A. McBeth, electrician	....	1	Leg broken.....	Fell from one floor to another in the mill.
			Total.....	41	5		

MINES OF ONTARIO

By E. T. Corkill, Inspector of Mines

I.—NORTHWESTERN ONTARIO

Actual mining work in northwestern Ontario in 1909 was confined chiefly to the Upper Manitou lake area, Sturgeon lake, Northern Pyrites mine, and the silver mines tributary to the Port Arthur and Duluth railway. The Atikokan iron mine was in operation all summer, as was also the blast furnace of the Atikokan Iron Company at Port Arthur. The Dominion Bessemer Ore Company shipped a couple of cargoes of iron ore from their property in the township of Macgregor, twenty-two miles east of Port Arthur, at the head of Thunder bay. A number of claims were taken up for iron ore near Lake Savant during the year, and considerable prospecting for gold was done in the Sturgeon lake area. Captain H. A. C. Machin, of Kenora, having taken an option on the old Mikado gold mine, has had it pumped out, and is examining it thoroughly. If active mining work is resumed at this property, we may look for further activity in Lake of the Woods.

Upper Manitou Lake Area

It is to be regretted that the owners of the Laurentian mine got into financial difficulties in November, 1909, as a result of which the mine was placed in the hands of a receiver and ordered to be sold. At present the mine is lying idle.

The Paymaster mine also closed down during December, 1909.

Laurentian Gold Mine

Work was carried on continuously until it was sold by the receiver. The purchasers have not done any work as yet.

The developments since the last Report have consisted chiefly in sinking a winze from the drift on the fourth level about 80 feet north of the shaft, a depth of 80 feet, and drifting from the bottom of the winze about 50 feet north and south. The drifts on the fourth level were continued to distances of 200 feet north and 150 feet south of the shaft. Between the third and the fourth, and also between the second and the third levels north of the shaft, considerable stoping was done.

A 6-inch pipe has been laid from the mill to Upper Manitou lake, nearly a mile distant, to supply water to the mill. The 20-stamp mill was kept running day shift the greater part of the year.

Mr. R. B. Nickerson was superintendent in charge, employing on an average thirty men.

The closing down of this property, which was considered by the public the mainstay of the district, is unfortunate, as it retards the investment of capital in other properties near, and discourages other companies attempting to develop paying mines.

Paymaster Gold Mine

The work done at this mine, beyond that described in the last Report, consists chiefly of drifting on the second and third levels. On the third level the drift has been driven north 175 feet from the shaft, and south 25 feet. Only one drill was operated underground for part of the year. Work at erecting a 10-stamp mill was under way. A cage was on the ground ready to be put in the shaft when all work closed.

Mr. Geo. Thow was superintendent in charge.

Detola Gold Mine

The Detola Mining and Development Company were engaged in development work at their property the greater part of the year. The main shaft was sunk to a depth of 155 feet. On this level drifts were driven northeast 126 feet and southwest 94 feet. On the 100-foot level, 100 feet of drifting and cross-cutting were done.

Mr. J. J. Backich, superintendent during the first part of the year, was succeeded by Mr. Dryden Smith.

Foulis Property

On Upper Manitou lake, about eight miles south of Gold Rock, Mr. J. C. Foulis was engaged during the latter part of the year prospecting a gold property. A shaft had been sunk about 40 feet. A 2-stamp mill was taken in just before the freeze-up in the fall of the year.

Minnehaha Gold Mine

At this property, owned by the Minnehaha Mining and Smelting Company, some mining work was carried on during the year. New camps were built and surface prospecting done during the summer.

Lake of the Woods District

There has been no marked revival of mining in this area during the year. The new owners of the Mikado gold mine have not yet begun active operations.

The Empire Gold Mining and Milling Company's property was not visited during the year. It is understood, however, that some work was carried on.

Sturgeon Lake Area

There was not as much mining activity at Sturgeon lake during 1909 as was anticipated. All the older properties were lying idle at the time of my inspection in the latter part of October. Access to the lake is very easy at present, being by way of the Grand Trunk Pacific railway from Fort William to Western Ontario Junction, then by way of the Western Ontario railway to the lake, a distance of seven miles. On the lake are several boats, most of them engaged in carrying freight for the National Transcontinental railway construction. The lake can be reached in about ten hours from Fort William.

At the St. Anthony mine there was some work performed during the year. New camp buildings were erected, but no mining was done.

At a claim three miles north of the St. Anthony, Mr. Wm. Leduit was engaged in sinking a shaft on a quartz vein. This shaft was, at the time of my visit, 48 feet deep. An 18-h.p. boiler and hoist were in use.

Vermilion (Northern) Pyrite Mine

This mine was inspected about the 1st of November, 1909. There is here a larger number of men employed, and greater activity, than at any other property west of Port Arthur. During the summer over 100 men were employed.

Mr. R. H. Craig is operating superintendent and Mr. R. C. Becker is manager.

An aerial tram has been built from the mine to the railway, about three miles distant, and about 7,000 tons of ore were shipped during the summer. The management of the mine purpose building a railway spur into the mine during the present year.

Underground the work has been carried on chiefly to prove the extent of the ore body, though during the summer there was considerable stoping done between the first and second levels east of No. 1 shaft, and on the south side of the vein. A raise was put through from the level below and by underhand stoping the ore was broken down into the raise and drawn off from the level below.

No. 2 shaft has been sunk to the first level and connected with No. 1 shaft by a drift about 400 feet in length. No. 2 shaft is a three-compartment shaft, sunk in the foot wall of the deposit and dipping at the same angle as the vein, which is 61 degrees to the horizontal. On the second level, from the cross-cut which has been driven across the deposit from No. 1 shaft, drifts have been run east 175 feet and west 50 feet. The ore is hard and fine-grained, and the shipments run from 45 to 48 per cent. sulphur.

A new rock house has been built near No. 2 shaft. The ore is trammed to this, passed through crushers and elevated to a trommel, which sizes it into (1) fines and (2)

ore that will pass through a 2½-inch ring. These products pass into storage bins, from which the buckets on the aerial tram are loaded.

A new 100-h.p. boiler has been installed near the rock house for supplying power to the rock house engine.

Atikokan Iron Mine

Work was resumed in August, 1909, and about 150 tons per day were shipped during the time of operation. The work consisted of stoping on the wide ore body, about 50 feet from the mouth of the tunnel. A raise was put through west of the tunnel, and the ore mined by a system of underhand stoping to the raise. The stope is carried about 40 feet in width.

To the east of the tunnel the ore body has been reached by an open cut, the rock being stripped away down to the ore. Connection was then made with the drift on the ore body 100 feet west of the cross-cut.

The ore is trammed out of the tunnel and dumped into a large gyratory crusher, then elevated to a bin above the railway track, and loaded direct into cars.

Mr. F. Rodda was superintendent of the mine for the Atikokan Iron Company, employing a force of about 35 men.

Atikokan Blast Furnace

The Atikokan Iron Company started work again at their blast furnace in July, 1909. Mr. J. D. Fraser is manager. Ore from the company's mine at Atikokan, 132 miles west of Port Arthur, was used entirely. A full description of the plant was given in the Seventeenth Report of the Bureau of Mines.

Port Arthur Silver Mines

Some of the old silver mines along the Port Arthur and Duluth railway, which produced during their period of operation half a million dollars' worth of silver, were re-opened last year. Work was done on the Beaver, West Beaver, Climax, Porcupine and West End Silver Mountain mines.

Beaver Mine

This mine is about seven miles from Stanley Junction, 23 miles west of Port Arthur, on the Canadian Northern railway. An attempt was made to run the mill, which was erected in 1908. Some difficulty was experienced, and work ceased.

West Beaver Mine

The West Beaver is about one-half mile west of the Beaver mine, and was opened in 1909 by Mr. F. Keefer, of Port Arthur.

A shaft was sunk on a vein to a depth of 63 feet, and an adit was being driven into the hill on the strike of the vein to tap the shaft at a depth of 75 feet. Camps were built for the accommodation of the men at this property and at the Climax mine.

Capain Thos. Opie was in charge of the mining work.

Climax Mine

This property is situated due west and adjoining the West Beaver. It was being worked under option by Mr. B. E. Cartwright and associates during the latter part of 1909. An old shaft 55 feet deep has been unwatered, and a 15-h.p. upright boiler and hoist installed.

Mr. Norman R. Fisher, of Cobalt, was consulting engineer, and Mr. Thos. Opie mine captain.

A shaft on the Porcupine has also been unwatered and a little work done.

West End Silver Mine

This mine has been worked at intervals for the last two or three years. At the time of my inspection, 19th November, 1909, work was being carried on, on the third and fourth levels of No. 2 shaft. The work consisted of drifting east on both levels, the third level, east drift, being now in 934 feet from the shaft, and the fourth level, east drift, 583 feet from the shaft. Both of these drifts are being driven on the vein.

Considerable work has been done on this property. Five shafts have been sunk; No. 5, the deepest, to a depth of 864 feet. No. 1 and No. 2 shafts are 536 feet apart, and are connected on the third level. The adit driven west to tap the third level of the mine is now in 575 feet, requiring 433 feet yet to be driven to connect.

The mill situated near the No. 2 shaft was run at intervals during the year. The property is being operated by the Hanson Consolidated Silver Mines, Limited, with Mr. W. T. Giles, secretary of the company, in charge at the mine.

Dominion Bessemer Ore Company

About 22 miles east of Port Arthur, at the head of Thunder bay, on lot C in the township of Macgregor, the Dominion Bessemer Ore Company, Limited, opened up an iron ore deposit in 1909, and shipped two cargoes of ore before the close of navigation. An ore-loading dock has been built, and a tramway from the dock to the ore body, about one mile inland. Half-way to the dock, at a convenient site, stock piles have been made. The ore will be loaded from these stock piles on tramcars and hauled to the dock, to be loaded directly into the boats. It is proposed to build ore pockets at the dock during the winter to facilitate the process of loading.

The ore lies in a bedded formation, varying in thickness from two to five feet. In mining it is separated into two grades, one grade running over 55 per cent. iron and the other below. Both grades carry a rather high percentage of manganese and no appreciable sulphur or phosphorus, and will thus be a desirable ore for furnace men.

Mr. S. G. Valentine is manager for the company. The contract for taking out the ore has been let to Mr. Arthur F. MacArthur, for whom Mr. F. W. Goodrich is in charge of the work.

II.—SUDBURY AND THE NORTH SHORE

In this area there was little change in 1909 so far as the working mines are concerned. The Canadian Copper Company and the Mond Nickel Company were the principal operators. The Dominion Nickel Copper Company were engaged chiefly in diamond drilling and building a spur from the Canadian Northern railway into the Whistle mine. The Bruce Mines is still the only copper property at work outside of the Sudbury district.

In the Michipicoten district the Helen iron mine continues to be the largest iron ore shipper in the Province. Other iron prospects were under development by the Lake Superior Corporation.

Shipments were made from the Moose Mountain iron mine, and preparations made during the past winter for a large output in 1910.

Gold

Havilah Mine

Work at this mine was carried on during the past year under manager S. H. Bryant. The old adit was cleaned out and timbered, and the shaft at the mouth of the adit cleaned out, timbered and sunk to the 100-foot level. The mine, formerly called the Ophir, is 18 miles north of Bruce Mines, in the township of Galbraith.



Dumping slag, Canadian Copper Company.



Underground, Creighton nickel mine.

Canadian Exploration Company

One mile south of Long lake, in township 69, and nine miles south of Naughton, the above company were steadily at work during the year. A 10-stamp mill with cyanide plant has been erected, and will be in operation in May, 1910. From the 75-foot level in the shaft about 400 feet of drifting has been done, with the view of exploring the ore body. It is intended to cyanide the ore direct without preliminary amalgamation, crushing it by stamps and tube mills.

Mr. R. W. Brigstocke is manager for the company.

Canadian Copper Company—(Nickel-Copper)

The Creighton and Crean Hill mines, owned and operated by the Canadian Copper Company, were heavy shippers during the year. A new quartz quarry was opened up in Dill township, alongside the Canadian Northern railway.

The officers of the company are: Mr. A. P. Turner, president and general manager; and Mr. John Lawson, general superintendent.

Creighton Mine

During the summer of 1909 work was carried on in the large open pit. Raises have the work was being carried on, on the second, fourth, fifth and sixth levels. During the breaking down the ore from the second to the third level by open pit work begun. The open pit is being carried down about the same size as on the second level. Both shafts are of the same depth as formerly described. In No. 1 shaft, fourth level, a drift has been run out about 150 feet to cut the ore body. No. 1 and No. 2 shafts are not yet connected on the fourth level. On the third level, No. 1 shaft, the ore is being drawn off from the open pit work. In No. 2 shaft, third level, the east end of the stope is being broken down as open pit. On the other parts of the ore body the filling system is in vogue, the ore being broken down by overhand stoping and the stope filled, the surplus ore being drawn off through chutes. On the fourth level, No. 2 shaft, all the ore is being broken down in this manner.



Power House and Rock House, Crean Hill nickel mine.

Crean Hill

During the year the shaft was sunk to the sixth level. At the last visit of inspection the work was being carried on, on the second, fourth, fifth and sixth levels. During the

summer part of the first level floor was broken down, making an open pit to the second level. The third and fourth level stopes have been worked in one stope for some time. The fourth and fifth levels were being worked by the filling system. Here the ore is sorted underground, and the stope filled with the waste rock, any surplus rock needed being let down from the surface through the raises. The area of the stopes has been enlarged during the year. On the sixth level the work was chiefly development work, consisting of driving a cross-cut from the shafts to and across the ore.

Quartz Quarry

The Canadian Copper Company last year opened up a quartz quarry in the township of Dill, on the main line of the Canadian Northern railway. About 300 tons of quartz are shipped daily to the smelter at Copper Cliff, where it is used as a flux and for converter linings. The quartz is being taken out by open pit work, derricks being used for hoisting.

Cobalt Refining Plant

This plant treated a large tonnage of high-grade ore shipped from the Cobalt mines during 1909, and was operated at its full capacity.

Nickel-Copper Smelter

There were no marked changes in the smelting plant during 1909. A description of the plant is given in the Seventeenth Report of the Bureau of Mines.

During the year the machine shop, car shop, foundry, warehouse, etc., near the general office, were torn down, new buildings having been erected near the smelter.

Roast Yards

The roast yards are now situated on the hill to the north of the town, between the town and the Manitoulin and North Shore railway. The roasted ore is loaded into drop-bottom cars by means of a steam shovel.

Mond Company—(Nickel-Copper)

The Mond Nickel Company are raising ore from the deepest level of any mine in the Province. They ship steadily now from the Victoria and Garson mines. Both mines use electric power, that for the former being obtained from the company's own plant at Wabageshik falls on the Vermilion river, and for the latter from the Wahnapitae Power Company, near Wahnapitae. A full description of these plants is given on another page of this report. The power for the smelter at Victoria mines is also obtained from Wabageshik falls.

Mr. C. V. Corliss is manager and Mr. O. Hall mine superintendent.

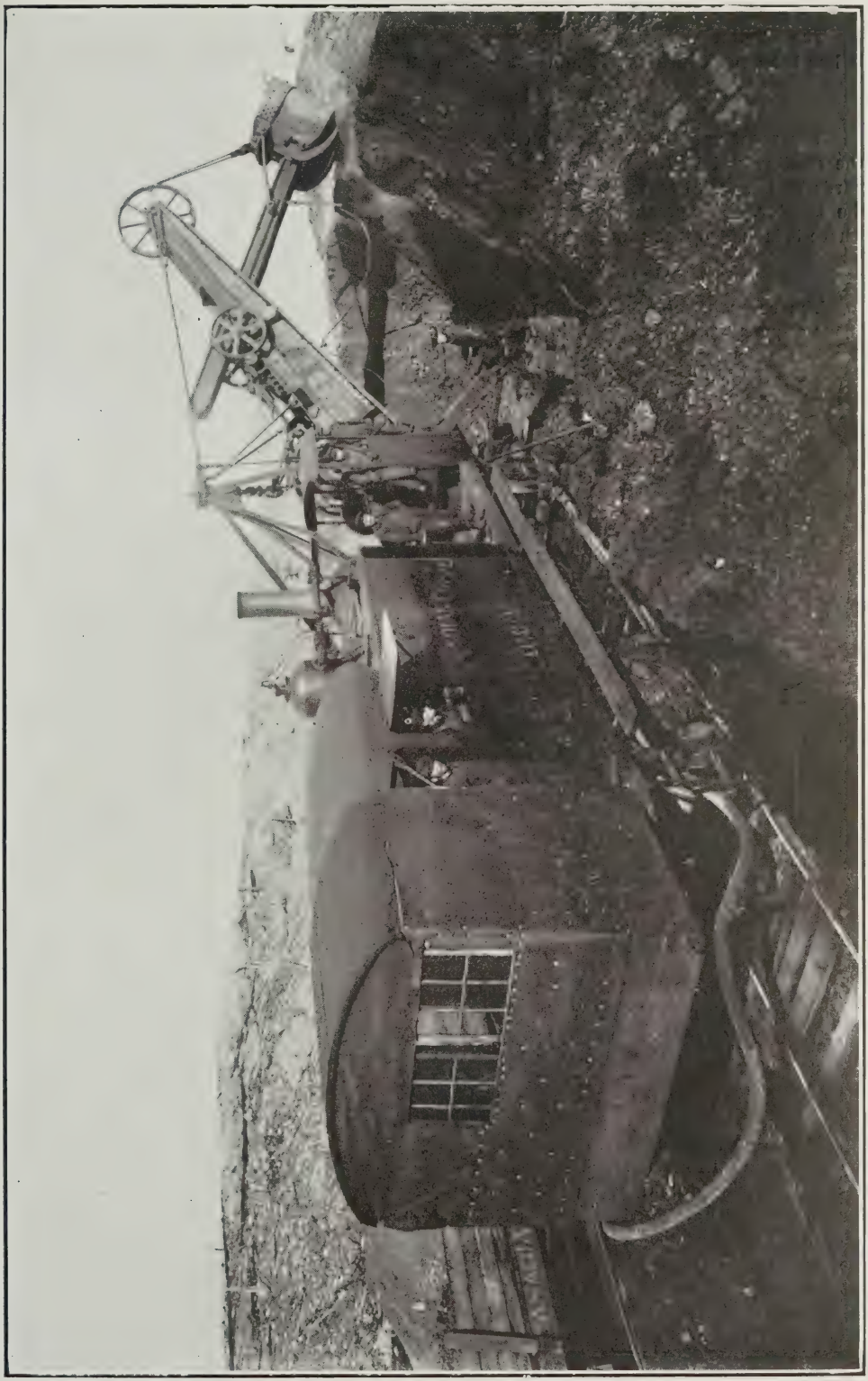
Victoria Mine

The main shaft is now down to the eleventh level. This is a depth of over 1,200 feet. The distance between the eighth and ninth and the ninth and tenth levels is 150 feet each, and between the tenth and eleventh 200 feet. The station has been cut at the eleventh level, and drifts started out to the ore body. Stoping is being carried on, on the eighth, ninth and tenth level stopes. On account of both ore bodies dipping to the east and the shaft being vertical, the distance to the ore on the lower levels is considerable.

Garson Mine

At this mine the shaft is now sunk to the 600-foot level. On the first and second levels stoping has been begun on the several ore bodies. On the third, fourth and fifth levels sections are being cut the full size of the ore body. On the sixth level the shaft station has been cut and cross-cut driven to the ore bodies.

The power house has been enlarged and a new air compressor, belt driven by motor, installed. This necessitated the installing of additional transformers.



Loading roasted ore with steam shovel, Canadian Copper Company.

Smelter

The smelter at Victoria mines was remodelled in 1908 and the capacity increased. It has been run continuously since that time on ore from the company's two mines.

Roast Yards

The roast yards are located on the line of the aerial tram about half-way between the smelter and Victoria mine. The green ore is brought from the mine to the roast yards by the aerial tram buckets which are then loaded with roasted ore and carried to the smelter. The green ore from the Garson mine is brought by train to the smelter, where it is loaded into the buckets on the aerial tram and taken out to the roast yards.

Quartz Quarry

The company obtain the quartz for flux and re-lining converters from a quarry about a quarter of a mile north of the smelter.



Moose Mountain iron mine.

Dominion Nickel Company—(Nickel Copper)

The Dominion Nickel Company were engaged during the year chiefly in diamond drilling and sinking a shaft at the Whistle mine. They were also constructing a spur line from the Canadian Northern railway to the property.

Copper

Bruce Mines

This mine was worked continuously during 1909 by The Bruce Mines, Limited. The concentrating mill has not been operated as yet by the present owners. Work in the mine has been carried on chiefly on the fourth level of No. 4 shaft, where some stoping has been done, and on the fifth level of No. 2 shaft, where drifts have been run east and west, a distance of 400 feet and 200 feet respectively. Some stoping was also done on the third level west of No. 4 shaft between Nos. 2 and 3 dikes. Most of the ore taken out is being stock-piled. A winze was sunk to a depth of 95 feet on the fourth level 500 feet west of No. 4 shaft. Some shipments were made during the year to the Mond Nickel Company.

Hermina Mine

Operations ceased during the summer of 1909. The work done since the last Report consisted in sinking the shaft to the 500-foot level and driving a cross-cut to cut the ore body.

Iron

Moose Mountain Mine

The Moose Mountain iron mine shipped steadily during the latter part of 1909. The ore was taken out of No. 1 deposit by underhand stoping from a face about 65 feet in height. It was then crushed to an inch product and passed over a magnetic cobber to sort out the waste rock. During the winter a large plant has been put in for magnetic concentration of the ore. The ore is trammed from the open pit and dumped into a large pocket, from which it is fed into crushers, which reduce it to a uniform size under 1 inch. It is then taken by incline belt conveyor to the magnetic concentrators about 300 feet south. Here it is dumped into bins, from which it is fed to the magnetic separator. It is then trammed about 100 feet and dumped into the railway cars. No ore is shipped during the winter months.

Mr. F. Jordan is manager.



Michipicoten Harbor, showing ore train from Helen mine.

Ore Docks at Key Inlet

The ore from Moose Mountain mine is hauled by the Canadian Northern railway a distance of 80 miles to the docks at Key Inlet. Here the ore is dumped from the hopper-bottom cars into bins. These bins are arranged so that they will feed from the centre of the bottom to a 42-inch travelling belt, which conveys the ore to a similar belt on the docks, and which in turn conveys and elevates the ore to the dock trestle, 60 feet above the water level. The ore is weighed by an automatic device while on the belt. When it reaches the dock trestle it is tripped off and dumped into pockets, from which it is spouted into the holds of the vessels alongside the dock. It is expected that 800 tons of ore per hour can be loaded. The pockets have a capacity of about 8,000 tons. The belts are driven by motors.

Michipicoten Area

Helen Iron Mine

The Lake Superior Power Company, owners of the Helen iron mine, shipped about 1,000 tons of ore per day during the season of navigation in 1909. No. 1 shaft is now down to the sixth level, a depth of 450 feet. This level is being opened up during the winter in a way similar to the fourth and fifth, with the view of shipping ore during 1910. Last year most of the ore was hoisted from the fifth level.

A drift was run north on the third level from No. 1 stope through the dike, a distance of 70 feet, and encountered a good grade of bessemer ore. The extent of the body was not proved at the time of my inspection.

A drift has also been driven south-east from the easterly limit of the iron ore, on the fifth level, a distance of 80 feet, where a body of iron pyrites was encountered. A considerable tonnage of iron pyrites has been blocked out. Next summer both iron ore and iron pyrites will be shipped. During the winter the ore taken out in development work was hoisted to the fourth level and dumped in the old stope, from which it will be drawn off when shipments begin.

The surface plant has been electrified throughout, electric power having been obtained from the Algoma Power Company at High Falls on the Michipicoten river. A new 12-drill compressor driven by a 200 horse-power motor has been installed, together with the following: An 80 horse-power motor to drive the crusher, 80 horse-power motor to drive No. 1 hoist, and a 150 horse-power motor to drive No. 2 hoist.



Loading Helen Mine ore at Michipicoten.

A new turbine pump driven by a 100 horse-power motor with a capacity of 500 gallons per minute against a 400-foot head has been installed on the fifth level. The power is brought from the power house at High Falls at 10,000 volts and stepped down at the transformer house at the mine to 550 volts. The steam plant is kept in reserve in case there is a break-down on the line or at the power plant.

Mr. A. A. Alsip is mine superintendent.

The company have also been developing an iron property called the Magpie, about 15 miles northeast of the Helen, and near the located route of the Algoma Central railway from Michipicoten to the main line of the Canadian Pacific. Construction work is now in progress on the railway from the Helen to the Magpie.

Other work is being done by the company at Iron lake south of White river, and at Goudreau lake.

Norwalk Gold Mine

This mine was originally known as the Manxman. It was in operation during most of 1909.

The shaft is now at a depth of 210 feet with levels at 100 feet and 200 feet. On the first level drifts have been driven north and south 25 feet respectively, and on the second level 75 feet south and 20 feet north. The shaft is on an incline of 30 degrees.

The old 10-stamp mill is being remodelled and a 25 horse-power motor installed to drive it. There is a 50 horse-power motor at the mine to operate the compressor. Power is obtained from the Algoma Power Company.

Mr. Samuel Moore is manager.

Kitchegammi Gold Mine

The Braddock Development Company took over the old Kitchegammi property about three-quarters of a mile from High Falls and started work at it in the spring of 1909. A mill was erected and two Nissen stamps installed, driven by a 75 horse-power motor,



Kitchegammi stamp mill, Michipicoten.

which also drives a 3-drill Fairbanks compressor. The shaft, which is said to be 100 feet deep, was not unwatered.

Mr. J. M. Herancame is superintendent.

The Grace mine, owned by the Le Page Gold Mining Company, was not in operation during the year.

Some prospecting was done on the claims owned by the Golden Reed Mining Company.

III.—TEMISKAMING

Cobalt and Vicinity

Cobalt's production of silver in 1909 exceeded that of any previous year, the total yield being about 26,000,000 ounces, compared with 19,437,875 ounces in 1908. The increased output required larger working forces at the mines, and consequently a larger amount was paid in wages for labor, the rate of wages being the same as in 1908. After the sale of the Gillies Limit lots in 1909, a considerable number of men were employed there, which increased the total of the number of men at work in the camp.

None of the companies who were developing water power were able to supply power during 1909. The incoming year will see the Cobalt Hydraulic Power Company, the Mines Power, Limited, and the Cobalt Power Company delivering power to the camp. The first company will supply compressed air, the second company both compressed air and electric power, and the third company electric power only. A number of small pro-



Underground view, Cobalt.

perties are shut down until the power reaches the camp. Some of the concentrating mills are unable to run to their full capacity owing to the lack of power. A full description of these three power plants will be found on another page of this Report.

As stated in a former Report, the concentration of ore at Cobalt has become very closely associated with the economic working of the mines.

On April 16th, 1910, mills were in operation at the following mines:—Buffalo, Cobalt Central, Colonial, Coniagas, King Edward, McKinley-Darragh, O'Brien, Silver Cliff, Temiskaming; the Ore Reduction Company and the Northern Customs Concentrator were also operating custom plants.

These 11 mills have a capacity of from 850 to 1,000 tons per 24 hours. The Coniagas, McKinley-Darragh and the Northern Customs have increased their capacity by the addition of 30 stamps, 10 stamps and 22 stamps respectively, which will increase the camp tonnage to 1,000 or 1,150 tons.

The Nova Scotia and the Trethewey mills are under construction and together will handle when completed about 175 tons per day. This will give a total concentrating capacity of 1,150 to 1,300 tons of ore per 24 hours. A small tonnage of concentrating ore was shipped during last year to the Montreal Reduction and Smelting Company at Trout Mills.



Northern customs Concentrator, cobalt.

South Lorrain

During the winter South Lorrain has come into prominence through the shipments of four carloads of ore from the Wettlaufer mine. Other silver discoveries were made, and as a result considerable mining work was done during the winter on a number of properties. The power line of the Mines Power, Limited, passes practically through the camp, so that electric power can be obtained without any difficulty. This company purposes installing a transformer station at Beaver lake and Latour lake to furnish power for the camp.

Montreal River

Although considerable mining and prospecting work has been going on in this area, only one carload of ore was shipped during the winter. This was from the Lucky Godfrey claim. The towns of Elk Lake and Smyth on opposite sides of the Montreal river were each visited by fire during the winter and considerable damage inflicted. These places form the distributing centre for the Montreal river area and are on the road to Gowganda.

Gowganda

The properties east and west of Gowganda lake shipped during the winter 292.8 tons of ore. The largest shipper was the Millerett Mining Company near Miller lake, east of Gowganda. The boom of one year ago injured the camp, but a number of properties are doing considerable development work. The high prices of supplies during 1909 enhanced the cost of mining. The Government road from Elk Lake to Gowganda was completed late in the fall of the year. This reduced the cost of haulage, the average freight rate on foodstuffs from Charlton to Gowganda during the winter being 1½ cents a pound. Access to the camp during the summer will also be quite easy by way of the Montreal river and the Government road to Gowganda.

Porcupine

In September, 1909, news of rich discoveries of gold in the townships of Whitney and Tisdale began to be reported. This occasioned a rush of claim-stakers into the district, and a few thousand claims were staked on the prospect of a big boom, which



Millerett Mine, Gowganda.

would give saleable value to anything staked out. The expected boom failed to arrive, although some of the better-known properties were taken over at fairly large figures. A few plants were rushed into the camp late in the spring of 1910. Some of the properties are in the hands of companies who will thoroughly test them during the next year.

A winter road was cut into Porcupine lake from Mileage 222 on the T. & N.O. railway. The route followed in the fall of 1908 was from Mileage 228 over a half mile portage to a small stream leading into Frederick House lake, then by way of the Frederick House river, Night Hawk lake and Porcupine river. Access in summer can be had by the above route or by way of the Mattagami river from the Transcontinental crossing south about 45 miles. This river runs within a mile and a half of the Hollinger claims.

Larder Lake

Very little mining work was done at Larder lake in 1909. Most of the work done consisted of assessment work to fulfil the requirements of the Mining Act.

Cobalt Silver Mines

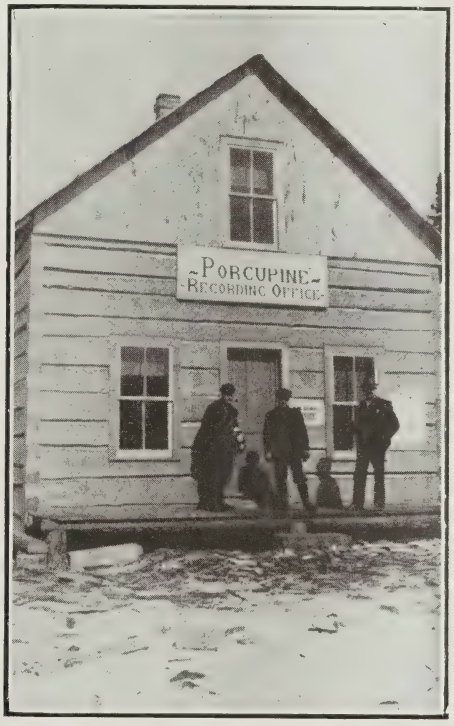
The following is a brief description of the principal mines and prospects of the Cobalt camp arranged alphabetically, followed by a description of the properties in South Lorrain camp, Montreal river, Gowganda and Porcupine. The amount of production and dividends paid will be found on preceding pages of the Report.

Alexandra

The Alexandra Mining Company are operating on the north part of the south-east quarter of the north half of lot 5 in the fourth concession of Coleman.

A shaft has been sunk 300 feet in depth and drifting started at this level. The shaft has passed through the diabase sill, into the conglomerate.

A 40 horse-power locomotive firing boiler and hoist are in use.



Porcupine Recording Office.

Argentite

This property is worked under lease from the Argentite Mining and Smelting Company, Limited, by Mr. W. J. White of New York. Considerable underground development work was done during the year.

Argentum

The Argentum Mines, Limited, have acquired a five years' lease of the Foster mine and also of the south-east quarter of the north half of lot 2 in the fourth concession of Coleman. The chief work on the latter location has been trenching and test pitting.

The workings of the Foster mine will be taken up under that heading.

Badger

Work at the Badger mine was continued uninterruptedly during 1909. The main work was carried on from No. 9 shaft. On the 100-foot level drifts have been run east and west 80 feet and 260 feet. This level is also connected by a raise with No. 1 shaft, which is 60 feet deep and has about 100 feet of drifting at that level. On the 200-foot level of No. 9 shaft drifts have been run east 180 feet and west 120 feet, from which point a drift has been driven south 125 feet, and about 120 feet of drifting done here under No. 7 shaft. East of the shaft 110 feet, a raise has been put through to the first level. No. 5 shaft, about 550 feet east of No. 6, has been sunk to a depth of 140 feet, and a drift driven south-west 289 feet.

Mr. A. A. Smith is manager.



Badger mine, Cobalt.

Bailey

The Bailey Cobalt Mines, Limited, on the termination of the lease to the Standard Cobalt Mines, Limited, on April 1st, 1909, commenced development, and have been operating since that time. About 600 feet of drifting has been done from the several shafts, in addition to that described in the last Report, which was done by the Standard Cobalt Mines, Limited.

Beaver

This property is owned by the Beaver Consolidated Mines, Limited, and began shipping ore in the latter part of 1909.

Ore was encountered in a 100-foot winze from a drift on a vein on the 200-foot level. On the second level, cross-cuts have been driven east and west, a distance of 310 and 320 feet respectively. The first vein was struck 60 feet east of the shaft, and on this a drift was run north 410 feet. At 210 feet north of cross-cut on this vein, a winze was sunk 100 feet, and 100 feet of drifting done at this level. The ore was found in this winze. On a vein 220 feet east of the shaft 400 feet of drifting has been done, and on a vein 230 feet west of the shaft, 240 feet of drifting.

The main shaft has recently been re-timbered, a new head frame and ore house erected, a new hoist installed and camp buildings erected.

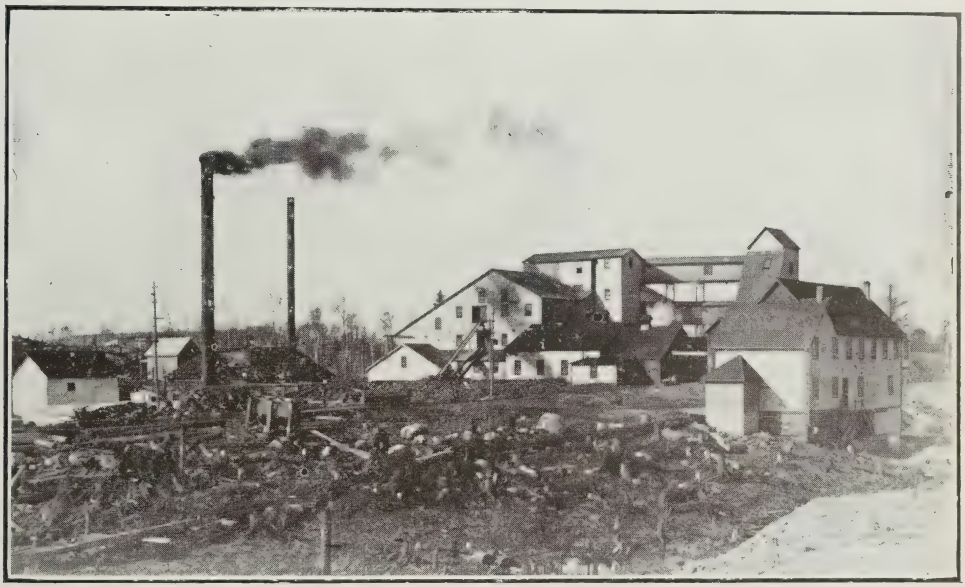
Mr. A. J. Hewitt is superintendent.

Belmont

The Belmont Silver Mines of Kerr Lake, Limited, own the north-east part of lot 2 in the fourth concession of Coleman. Work has been in progress for the last year under Mr. L. Brown. A shaft has been sunk to a depth of 80 feet and considerable surface trenching done. Power was obtained from the Silver Cross mine.

Buffalo

The main part of the development work at the Buffalo mine was confined to the southern portion of the claim. No. 12 shaft was sunk to the third level, and 1,000 feet of drifting done on this level, opening up some good ore bodies. On the other



Buffalo concentrator, Cobalt.

levels the mining work consisted chiefly of putting in timbers preparatory to stoping and in breaking down ore in the stopes. All the ore is trammed underground to No. 6 shaft, where it is hoisted to the mill.

The mill has been slightly remodelled and a cyanide plant added, which has been in operation for several months. The scheme of concentration is not greatly altered, being as follows:—Ore is passed through crusher, then to No. 1 rolls, and through trommel. Then the different sizes go to jigs. The coarse jig tailings pass through other sets of rolls, and the coarser product goes to classifiers and to Wilfley and James tables. The middlings from the tailings, and the fine product from the jigs, pass through a Chilian mill, then to classifier, the overflow going direct to the cyanide tanks and the sands to four Deister tables. The middlings from these tables are sent back to the Chilian mill.

Mr. Tom R. Jones is general superintendent.

Canuck

The Canuck Silver Mines Cobalt, Limited, own the southeast quarter of the south half of lot 13, in the first concession of Bucke.

The shaft is 150 feet deep, and about 30 feet of drifting have been done. There is a 12-h.p. upright boiler and hoist.

Casey Cobalt

This property, situated on the southeast quarter of the south half of lot 5, in the first concession of Casey, and owned by the Casey Cobalt Mining Company, was not in operation the first part of the year. After beginning work again some good ore was encountered on the 220-foot level of the mine. On this level 200 feet of drifting and cross-cutting have been done and some stoping.

Mr. James Rennie, former manager of the mine, has been succeeded by Mr. James Hoskin.

Century

This location, owned by the Century Silver Mining Company, Limited, with head office in Toronto, is situated on the east half of the northeast quarter of the north half of lot 1, in the sixth concession of Coleman.

The shaft has been sunk to a depth of 175 feet, and about 300 feet of drifting and cross-cutting done, also considerable trenching.

Chambers-Ferland

The Chambers-Ferland Mining Company have been working chiefly in No. 1 shaft, on a vein which is the continuation of No. 10 vein on La Rose. This shaft is 100 feet deep, with levels at 42 feet and 93 feet. The distance of the vein between La Rose and O'Brien lines is about 180 feet. Above the first level considerable stoping has been done.

Work at No. 2 shaft ceased in May, 1909. The shaft was sunk about 100 feet, and about 900 feet of drifting and cross-cutting done on this level.

Mr. C. Watson is manager.

City of Cobalt

The City of Cobalt Mining Company, Limited, have been mining steadily during 1909. The main shaft remains at the same depth, but a winze has been sunk west of the shaft to a depth of 65 feet, from which level about 700 feet of drifting has been done. A cross-cut has been driven north and east from the shaft a distance of 1,000 feet. A good deal of stoping has been done between the first and third levels, both east and west of the shaft. A considerable tonnage of milling ore has been developed, and the company have constructed a tramway from their shaft to the Northern Customs Concentrator for tramming the ore to the mill for treatment.

Mr. A. S. Stevens is superintendent.

Cleopatra

The Cleopatra Mining Company took over from Mr. Bannell Sawyer lots A.24, A.25 and A.38 on the Gillies Limit, purchased by him from the Ontario Government. Considerable surface work, such as trenching, was done during the latter part of 1909. A shaft is being sunk, the present depth being 100 feet.

Cobalt Central

The Standard Cobalt Mines sank a shaft to a depth of about 50 feet on the Gamey location last year.

The Cobalt Central mine was continuously in operation, and the shaft was sunk to the fifth level, a depth of about 330 feet. The fourth level, at a depth of 255 feet, is all in slate, this formation having been encountered at a depth of 230 feet. Considerable ore was stoped from this level, and about 800 feet of drifting done. On the fifth level a drift has been driven from the shaft 100 feet.

The concentrating mill was run steadily throughout the year, treating from 80 to 100 tons of ore per day.

Cobalt Gem

The Cobalt Gem Mining Company, Limited, own the east half of the southwest quarter of the south half of lot 3 in the fourth concession of Coleman. The principal work done during the summer was trenching. The large nugget of float bought by the Ontario Government, a description of which is given on a previous page, was found on this claim. Some test pitting has also been done.

Cobalt Lake

The mining work done by the Cobalt Lake Mining Company during the last year was confined to No. 6 shaft at the south end of the lake. The level at 130 feet has been run west along the McKinley-Darragh boundary, a distance of 500 feet. A winze was sunk here to a depth of 50 feet, and 250 feet of drifting done on the vein on this level. A cross-cut was here driven west, and another vein was encountered parallel to the first. On this vein 100 feet of drifting has been done. The winze is being sunk another 50 feet. Not much stoping has yet been done on the veins.

The work of running a drift from No. 1 shaft across the lake was completed in 1909. The drift is about 400 feet in length.

Mr. A. P. Seymour is manager.

Cobalt Merger

A controlling interest in the Cobalt Merger, Limited, was purchased in September, 1909, by the Right of Way Mining Company, and some work, consisting chiefly of trenching, was done on the claims during the latter part of the year.

Cobalt Paymaster

The Cobalt Paymaster Mines, Limited, have taken a lease of the northeast quarter of the north half of lot 6, in the sixth concession of Coleman, and were engaged in work on it during 1909. The shaft is sunk to a depth of 115 feet, and a cross-cut has been run north about 250 feet. On two of the veins which were struck some drifting was done. The company have had a diamond drill at work on the property for some time. The surface plant consists of a 50-h.p. boiler, 4-drill compressor and hoist.

Mr. M. B. Gordon is manager.

Cobalt Silver Queen

The only work that is being done on this property now, is sinking the main shaft. This is being put down from the 150-foot level to the 400-foot level. It is now at a depth of 275 feet. The ore has been mostly stoped out of No. 1 vein.

Another shaft, 500 feet south of No. 1 shaft, was sunk during 1909 to a depth of 86 feet. From this shaft 300 feet of drifting was done. Other prospect shafts have been sunk on the property, and a considerable amount of drifting done.

Mr. Robt. A. Bryce is superintendent.

Cobalt Station Grounds

The Cobalt Station Grounds Mining Company, Limited, acquired a lease of two parcels of ground from the Temiskaming and Northern Ontario Railway Commission. One parcel is the mining rights extending under the right of way just south of the Right of Way Mining Company's shaft at the north to near the Silver Queen property, including the station grounds. The other parcel consists of two town lots, Nos. 388 and 389. The work of prospecting these lots began in the fall of 1908, consisting of trenching, diamond drilling and shaft sinking. No. 4 shaft of the Cobalt Lake Mining Company was taken over for a time, and some drifting and cross-cutting done from their workings, which had been extended west to the railway right of way. After work ceased here a shaft was sunk near the railway cut south of the station. This shaft was sunk to a depth of 140 feet.

Mr. T. A. Beament, of Ottawa, is president of the company, and Mr. J. B. Watson secretary-treasurer.

Cobalt Town Site

The Cobalt Town Site Mining Company, Limited, resumed operations during 1909. The main work being done is driving a cross-cut from the main shaft south to cut a vein on which the Right of Way Mining Company are working. This cross-cut has been driven about 300 feet.

Cochrane Cobalt

The Cochrane Cobalt Mining Company, Limited, have done considerable work on the east half of the southwest quarter of the north half of lot 1, in the third concession of Coleman.

A shaft has been sunk to a depth of 230 feet. On the 100-foot level a cross-cut has been driven 15 feet. On the 200-foot level the cross-cut west is 79 feet in length and east 160 feet. The east vein is 84 feet from the shaft, and a drift has been run south on this vein 106 feet. The west vein is 48 feet from the shaft, and has 14 feet of drifting on it.

A plant, consisting of a 60-h.p. boiler, 4-drill compressor and hoist, has been installed.

Sir Henry Pellatt is president of the company, and Mr. J. W. Shaw is mine superintendent.

Colonial

The Colonial Silver Mines resumed mining operations in Oct., 1909, after having been suspended for about a year. Work is being carried on from the adit about 100 feet from the mill. This adit has been driven southeast about 400 feet. At 240 feet from the mouth of the adit a shaft has been run on a vein, west 250 feet. From this drift a winze has been sunk 75 feet, and a raise put through to another adit level, about 30 feet above. On a vein on this level some stoping is being done. A hoist has been put underground on the main adit level, and the ore will be hoisted to this level, and thence trammed to the mill. The old workings consist of an adit 500 feet east of the present working adit. Here there are some 1,000 feet of drifting and cross-cutting. On the adit south of the office about 1,000 feet of work has also been done.

The 10-stamp mill was completed last year. The ore is trammed from the adit and dumped into the crusher, from which it passes into rolls and over trommels, the fine product going direct to the classifier, while the coarse product goes to a Hartz jig. The tailings from the jig go to the 10-stamp mill, and thence to a classifier. The several products from the classifier are led to a Wilfley table, Deister table and Deister slimer. A tube mill is being put in to re-crush the tailings from the sand tables.

Electric power is used throughout the mill, the power being obtained from the Cobalt Power Company.

Mr. C. B. Kingsley is manager.

Columbus

No work was going on at this property during the latter part of 1909. The work done, in addition to that described in the last Report, consisted chiefly of driving a cross-cut from the 240-foot level east, a distance of 150 feet, and some drifting.

Coniagas

The mine and mill of the Coniagas Mines, Limited, were operated continuously during 1909. According to the superintendent's report 51 feet of shaft sinking, 1,254 feet of drifting, 376 feet of cross-cutting and 80 feet of winzing were done during the year, in addition to obtaining 19,472 tons of ore by stoping.

Most of the development work underground was done on the 150-foot level. A winze was sunk about 170 feet southeast of No. 2 shaft a depth of 75 feet. A drift was driven from this to No. 2 shaft and a raise put through. The third level of No. 2 shaft is, therefore, at a depth of 225 feet.

No. 4 shaft, near the south end of the property, was sunk to a depth of 55 feet.

About 70 tons per day were treated in the mill. Thirty stamps were added in the latter part of 1909, with tables to handle the product. This addition is ready to operate when the electric power being developed on the Montreal river and on the Matabitchouan river is supplied, and will raise the tonnage the mill is capable of handling to 150 or 160 tons per 24 hours.

Coniagas Reduction Company

The Coniagas Mines, Limited, own the capital stock of the Coniagas Reduction Company. The reduction plant is located at Thorold, and during 1909 treated the entire product of the Coniagas mine and 315 tons of ore purchased from other mines. The company have during the year put up further extensions to refine not only the silver and arsenic, but also the nickel and cobalt, which have been stocked up to the present.



Coniagas shaft house and concentrator.

Consolidated Silver (Green-Meehan)

The Consolidated Silver Cobalt Mines, Limited, took over the Green-Meehan and Red Rock mines. Considerable trenching was done on the properties during 1909. The mining work on the Green-Meehan to date consists of sinking two shafts 110 feet and 85 feet. On the 100-foot level drifts have been driven north 200 feet and south 225 feet, and 175 feet of cross-cutting done. An open cut was run on the vein, on which the main shaft was sunk, for a length of 250 feet.

On the Red Rock no work has been done for about two years. Prior to this three shafts had been sunk to a depth of 35, 75 and 110 feet respectively. On the 100-foot level of the deeper shaft about 200 feet of drifting was done.

On the Green-Meehan a plant was installed, consisting of two 100-h.p. boilers, 12-drill compressor and hoist.

Mr. Howard Chapin is mine superintendent.

Cross Lake

The Cross Lake Silver Mining Company, of which Mr. Carl Reinhart is president and manager, have been working on the southwest part of the southwest quarter of the south half of lot 1, in the fifth concession of Coleman. The work has consisted chiefly of trenching, and of sinking a shaft to a depth of 50 feet by hand.

Crown Reserve

The Crown Reserve Mining Company have, since July, 1908, paid over one and a half million dollars in dividends. The development of the property has been carried on very energetically during that time. No. 1 and No. 2 shafts are both sunk to a depth of 200 feet, and a winze at the east end of the Carson vein has been sunk another 100 feet. On the first level a cross-cut has been driven north, a distance of 480 feet and east 520 feet. There has also been considerable drifting on the veins encountered. Altogether, on the first level there has been about 2,500 feet of drifting and cross-cutting. On the second level a drift has been run on the Carson vein for a distance of about 250 feet. Cross-cuts have been driven north 300 feet and east 450 feet. Some stoping has been done on the Carson vein on the second level. Stoping has been carried on, on this and the north veins on the first level.

A larger plant was installed, consisting of a 12-drill compressor, another 100-h.p. boiler, and a larger hoist.

Crysler-Niles

The Crysler-Niles Mining Company, Limited, own the northeast quarter of the south half, and the southeast quarter of the north half, of lot 2 in the tenth concession of Lorrain.

The main shaft has been sunk to a depth of 200 feet, and a great deal of trenching done on the surface.

The plant consists of a 60-h.p. boiler and a 4-drill compressor and hoist.

No work was being done at the property in February, 1910.

Dreadnought

The Dreadnought Mines, Limited, took over the holdings of the Rothschild Mining Company, consisting of the northwest quarter of the north half of lot 3, in the third concession of Coleman.

Considerable trenching had been done and two shafts sunk by the former owners. These shafts were 75 feet and 100 feet deep respectively, and there was some drifting and cross-cutting at one of the levels.

A 60-h.p. boiler and a 4-drill compressor and hoist were installed by the old company.

Drummond

During 1909 the underground work at the Drummond mine consisted chiefly in cross-cutting north from the 200-foot level of the main shaft under Kerr lake. This cross-cut has been driven about 400 feet. During the year considerable trenching and diamond drilling were done on the property. A large amount of the milling rock on the dump was shipped to Trout Mills for concentration.

Mr. R. W. Brigstocke is manager.

Eastbourne

The Eastbourne Cobalt Mines, Limited, have been operating on the north half of the northeast quarter of the south half of lot 2, in the fourth concession of Coleman. A shaft has been sunk to a depth of 100 feet, in addition to considerable trenching and surface work.

Empire

The Empire Cobalt Mines, Limited, have a number of properties in Lorrain and Coleman. On lot 2, in the tenth concession of Lorrain, a shaft has been sunk to a depth of 125 feet, and some drifting done.

A small plant, consisting of boiler, compressor and hoist, has been installed.

E. T. Property

The E. T. Mining Company have acquired the north half of the northwest quarter of the north half of lot 1, in the fourth concession of Coleman, and have been working on it during 1909. Some trenching was done, and a shaft sunk to a depth of 100 feet.

Mr. L. Brown is consulting engineer for the company.

Farah

The Farah Mining Company have been working continuously during the year. No. 1 shaft is 150 feet deep and has a drift north 200 feet. No. 3 shaft is 150 feet deep, with the first level at 75 feet. Drifts have been driven north on the first level 140 feet, and on the second level 100 feet. No. 5 shaft is 50 feet deep, with some drifting at this level.

Foster

The Foster Cobalt Mining Company, Limited, decided in April, 1909, to lease the Foster mine to the Argentum Mines, Limited, for a term of five years. Under the agreement the Argentum Company are to expend $25,000 during the first year, and to work continuously for the balance of the term, and to pay the Foster Cobalt Mining Company 50 per cent. of the net profit each year up to $100,000.

The Argentum Mines have carried on work continuously since April under Superintendent J. MacDonald, both above and below ground. Considerable diamond drilling was also done on the property during 1909.

Gifford

The Gifford Cobalt Mines, Limited, have been developing the north half of the northeast quarter of the north half of lot 1, in the third concession of Coleman.

A shaft has been sunk 200 feet, and 150 feet of drifting and cross-cutting done.

The plant consists of a small boiler and hoist. Air for drilling is obtained from the Temiskaming mine.

Mr. Chas. Gifford, Toronto, is president of the company.

Gifford Extension

The Gifford Extension Mines, Limited, control the southwest quarter of the south half of lot 1, in the third concession, and the north half of the east half of the southwest quarter of lot 2, in the third concession, both in Coleman.

A number of test shafts have been sunk on the property and considerable trenching done. A shaft has been put down a depth of 200 feet, and about 75 feet of drifting done, on the lot adjoining the Ophir.

Goodwin Lake

The Goodwin Lake Mines, Limited, have five 40-acre claims on lots 3 and 4, in the eighth concession of Lorrain.

A shaft has been sunk to a depth of 100 feet, and considerable prospecting done on the surface.

Mr. Wm. Cuthbert, of Montreal, is president of the company.

Gould Consolidated

The Gould Consolidated Mines, Limited, are working a lease from the Peterson Lake Silver Mining Company on Cart lake.

Two shafts have been sunk, one 60 feet and the other 150 feet. In the deeper shaft about 60 feet of drifting has been done on the 75-foot level, and 60 feet on the 150-foot level.

Hargrave

The Hargrave Silver Mines, Limited, were actively engaged last year in mining operations on the southwest quarter of the north half of lot 2, in the fourth concession, and the northwest quarter of the south half of lot 3, in the fourth concession of Coleman. No. 3 shaft was sunk to a depth of 375 feet. On this level a drift was run north 160 feet, and from here a cross-cut was driven west 50 feet, and 150 feet of drifting done north and south on the vein cut by this cross-cut. On the 175-foot level drifts have been run south 150 feet and north 135 feet, also a cross-cut of 65 feet. On No. 1 shaft, on the north end of the east lot, a shaft has been sunk to a depth of 75 feet, and about 40 feet of drifting done.

Mr. E. V. Neelands is mine superintendent.

Imperial Crown

The Imperial Crown Mines, Limited, of which Colonel John Carson, of Montreal, is president, acquired the west half of the southeast quarter of the south half of lot 3, in the fifth concession of Coleman, and have been engaged prospecting it during 1909. A great deal of trenching was done, and one shaft was sunk to a depth of 100 feet, with 100 feet of drifting at this level.

Power was obtained from the Crown Reserve Mining Company.

John Black

The John Black mine comprises the west half of the north-west quarter of the north half of lot 1 in the second concession, and the north half of the south-east quarter of the north half of lot 2 in the second concession, both in the township of Coleman. It is owned by the Black Mines Consolidated, Limited.

A shaft has been sunk to a depth of 200 feet. On the first level there is about 50 feet of drifting north and south of the shaft and a cross-cut west 80 feet. On the 200-foot level a cross-cut has been driven west 100 feet and drifts north and south 50 feet respectively.

The plant consists of two 50 horse-power boilers, a 6-drill Sullivan compressor and hoist.

Mr. B. Neilly is superintendent.

Kerr Lake

During 1909 the Kerr Lake Mining Company paid in dividends to shareholders $750,000.

The two shafts from which the production is obtained are No. 3 shaft on the south end of the property, and No. 7 shaft on the north end near the lake. On No. 7 shaft the work during the year was carried on chiefly on the third and fourth levels, from which also the production came. On the third level drifts have been run south 120 feet and north 340 feet. From the north end of this drift, cross-cuts and drifts have been extended east and west, a distance of 350 feet and 300 feet respectively. About 400 feet of drifting has been done on veins and stringers in addition to this. A winze has been sunk to the level below. Most of this working is under the lake. On the fourth level a drift has been extended north 400 feet, and a drift from this 160 feet west, also 200 feet of additional drifting along the veins. Some stoping has been done on both levels. The second level of No. 7 shaft has been connected with No. 3 shaft near the railway by a drift 600 feet in length. From this shaft 1,100 feet of drifting and cross-cutting have been done in addition.

On the first level of No. 2 shaft, just south of the railway, 300 feet of drifting has been done.

On No. 3 vein, work is being done on the fourth and fifth levels. Drifts have been run north and south from the shaft on the fourth level, a total distance of 300 feet, and the same on the fifth level. Stoping is being carried on on both these levels. On the fifth level a winze has been sunk a depth of 50 feet. On the second level a cross-cut has been driven to a point under No. 2 shaft, a distance of 550 feet.

Mr. S. R. Heakes is manager.

Kerr Lake Majestic

The property owned by the Kerr Lake Majestic Mines, Limited, was under option to The Kerr Lake Mining Company during part of 1909. This option was surrendered the last of the year, and no work has been done on the property since that time. The work on the claim consists of one shaft, on the top of the hill, sunk to a depth of 112 feet, and drifts run north, east and west, distances respectively of 150 feet, 175 feet and 225 feet. The shaft sunk near the lake shore has a depth of 150 feet. An adit was also driven from near the lake shore north, a distance of 250 feet.

A power plant, consisting of two 125-h.p. boilers, a 12-drill compressor and hoists, has been installed.

Kerry

The Kerry Mining Company have leases on 20 acres of Peterson lake and the northern part of Cart lake. No work was done on the Cart lake lease in 1909. On the Peterson lake lease the shaft has been sunk a depth of 200 feet, with the first level at 125 feet. From this level drifts have been run north and south from the shaft distances of 125 feet and 150 feet respectively. On the second level a drift has been run south 300 feet.

Mr. Herbert E. Jackman is manager.

King Edward

Work was carried on continuously throughout the year by the King Edward Silver Mines, Limited. The general plan of development and operation of the mines outlined in former Reports has been followed. During the year stoping was carried on in the main vein, and the 10-stamp mill run continuously.

Mr. Glenn Anderson is manager.

La Rose Consolidated

La Rose Consolidated Mines Company paid $1,206,791 in dividends in 1909. Practically all the ore which paid these dividends was taken from La Rose mine. The Princess, Lawson and University were small producers.

Mr. D. Lorne McGibbon is now president of the company, and Mr. R. B. Watson manager. La Rose Consolidated control the following properties:—La Rose, La Rose Extension, Princess, Fisher, Epplett, Silver Hill, University, Violet, Lawson.

Work is being done on the La Rose, Princess, University and Lawson. A brief description of the work done is here given.

La Rose:—The development on the main vein was quite fully described in the last Report. On the 110-foot level a drift has been driven on the vein north 860 feet and south 340 feet, or a total length of 1,100 feet on the vein. A drift has been driven to the Macdonald vein from the 85-foot level of the main vein. On this level of the Macdonald vein, 420 feet of drifting has been done. A winze has been sunk 40 feet from this level, and 150 feet of drifting done from the bottom of the winze. A cross-cut has been run from the Macdonald vein on the 85-foot level to No. 10 vein, and 75 feet of drifting done on it. At a distance of about 200 feet from the main vein and parallel to it, a cross-cut has been driven from the Macdonald vein to No. 3 vein, a distance of 575 feet, and extended south 350 feet from No. 3 vein. No. 3 shaft has been sunk to the 110-foot level, and 220 feet of drifting done, also some stoping on the vein. From this level a cross-cut has been driven northeast 140 feet.

The company are now shipping their low grade ore to the Northern Customs Concentrator for treatment.

Lawson:—Work was begun at this mine in May, 1909. The old Silver Leaf shaft near the north side of the property was pumped out, and drifting begun south, on the 88-foot level. The main shaft was sunk to the same level, and drifts run east, north and south, and the shaft connected underground with the Silver Leaf shaft. The drift south

has been run 250 feet and cross-cuts driven east and west 175 feet. A raise has been put through to the surface on the main vein, 150 feet south of the Silver Leaf shaft. No. 2 shaft is 30 feet deep, with 100 feet of drifting. No. 8 shaft is 40 feet deep, with 75 feet of drifting. No. 11 shaft is 45 feet deep, with 50 feet of drifting.

A shaft house, ore-sorting house and new camp buildings have been erected.

Princess:—The main shaft is now at a depth of 150 feet, with levels at 50 feet and 132 feet. On the 50-foot level about 400 feet of drifting has been done. On the 132-foot level a cross-cut has been driven north 450 feet. On the first vein encountered, 90 feet north of the shaft, 300 feet of drifting has been done, also some stoping. A raise has also been put through to the first level. On the vein 400 feet north of the shaft 110 feet of drifting has been done.

An ore-sorting house has been erected.

University:—The work done at this mine consisted of sinking a shaft 100 feet and doing 100 feet of drifting on the 90-foot level.

An ore-sorting house was erected at this shaft.

Little Nipissing

The Little Nipissing Silver Cobalt Mining Company, Limited, have carried on but little work on J.B. 2 during the last year. They have, however, done considerable development on their 20-acre lease on Peterson lake. The shaft has been sunk to a depth of 160 feet, and on this level there has been about 1,100 feet of drifting and cross-cutting done. A vein of good ore was found during the latter part of the year.

Mr. M. B. Gordon is manager.

Lumsden

The Lumsden Mining Company have been operating on the west half of the north-east quarter of the north half of lot 2, in the third concession of Coleman. Three prospect shafts have been sunk to a depth respectively of 30, 50 and 75 feet. Another shaft, on which work is being done, is 175 feet deep, with some drifting on the 100-foot level, also on the 175-foot level.

Air for drilling is obtained from the Badger Mining Company.

Mr. F. I. Daniels is manager.

McKinley-Darragh-Savage

The McKinley-Darragh-Savage Mines of Cobalt, Limited, under the management of Mr. P. A. Robbins, have operated their mines and mill steadily during 1909. According to the report of the manager there were 2,453 feet of drifting, 2,568 feet of cross-cutting, 99 feet of shafts, 175 feet of winzes and 301 feet of raising done during the year.

The workings have now been carried down to a depth of 250 feet, a winze having been sunk 100 feet deep from the 150-foot level on the lake vein, and 50 feet of drifting done. On the 200-foot level several hundred feet of drifting has been done. Stoping is being done on the 150-foot level.

The 20-stamp mill has been treating from 70 to 80 tons of ore per day during the year. Ten stamps additional are being installed. Motors are being put in the mill to drive all the machinery, electric power being supplied by the Mines Power Company.

Mining work on the Savage has been confined chiefly to No. 3 shaft. This shaft has been sunk to a depth of 140 feet. On the 80-foot level about 425 feet of drifting has been done, connecting with the No. 4 shaft. On the 140-foot level about 100 feet of drifting has been done. No. 2 shaft has been sunk 112 feet. A new shaft house has been erected over No. 4 shaft, the No. 3 shaft house having been destroyed by fire, and an ore-sorting house built, in which crushers and jigs have been installed.

Meteor

The Meteor Mining Company have acquired the northeast quarter of the north half of lot 5, in the fourth concession of Coleman, and have begun operations on the west side of diabase mountain. An adit has been driven east a distance of 250 feet.

Mr. A. Cairn Hodge is manager.

Michigan Cobalt

The Michigan Cobalt Mines have leased from the Amalgamated Cobalt Mines Company the southwest quarter of the south half of lot 3, in the fifth concession of Coleman.

A shaft has been sunk 100 feet, and drifts run east 175 feet and west 200 feet. The plant consists of a small boiler and hoist. Air for the drills was obtained from the Kerr Lake Majestic Mining Company.

Nancy Helen

The Nancy Helen Mines, Limited, were engaged in mining on their property for only part of the year. On the 100-foot level several hundred feet of drifting and cross-cutting has been done, and also some stoping; and on the 190-foot level 200 feet of drifting and cross-cutting.

No work was being done in the mine in February, 1910.

Nipissing

The Nipissing Mining Company paid $1,350,000 in dividends in 1909. The company have paid up to 31st December, 1909, $4,355,000 in dividends.

Work was being carried on at the following shafts at the date of my inspection in February, 1909: Kendall, veins Nos. 49, 122, 26, Fourth of July, Meyer and No. 64. Some other shafts were worked during part of the year, and a great deal of trenching done.

The Kendall continued to be a large producer. On the 140-foot level drifts have been extended west 205 feet and east 300 feet, to the intersection of the vein running northeast by southwest. On this vein 280 feet of drifting has been done. A raise has been put through from the north end of this vein to the surface, and near the south end a winze is being sunk. Stoping has been done on both levels on both the veins. A new ore-sorting house was erected at this shaft.

On vein 49 work has been carried on irregularly. The underground developments have been described in a former Report. The work done on the vein during the year consisted chiefly of underhand stoping the vein from the surface.

On vein 122 a shaft has been sunk to a depth of 150 feet. On the 75-foot level a drift was run west 260 feet, crossing the drift on vein 25. A new shaft house and ore-sorting house have been erected.

On vein 26 the work done was fully described in a former Report. During 1909 most of the work has consisted of stoping on the several levels. A winze is now being sunk from the lower level.

At the Fourth of July shaft, veins Nos. 80 and 100 are being worked. On the 70-foot level, vein 80 has been drifted on for about 300 feet in length, and vein 100 for 380 feet. A cross-cut has also been run south 280 feet. On the 190-foot level 600 feet of drifting and cross-cutting has been done, and a raise put through to the first level.

The Meyer shaft has been sunk 190 feet on vein No. 73, and about 500 feet of drifting done on it.

The shaft on vein 64 has been sunk 270 feet. On the 172-foot level, 300 feet of drifting has been done on the vein, and a raise put through to the first level. On the 270-foot level a drift has been run east 250 feet. A shaft house and an ore-sorting house have been erected.

Mr. R. B. Watson is general manager, and Mr. Hugh Park manager.

North Cobalt

The North Cobalt Silver Mines Company have been developing part of the northwest quarter of the north half of lot 13, in the first concession of Bucke, and have sunk a shaft to a depth of 135 feet, and a winze from a point 75 feet west of the shaft another 50 feet. On the 75-foot level about 500 feet of drifting was done, and about 250 feet on the 135-foot level. Some ore was shipped from the property.

Mr. J. A. Jacobs is president of the company, and Mr. A. M. Bilsky managing director.

Northern Customs Concentrator

The Northern Customs Concentrator, Limited, is an independent company, with mill situated on the town site of Cobalt south of the railway station. In January, 1910, the company had a contract for concentrating the milling ore of La Rose and City of Cobalt mines. Mill rock from the Silver Queen, Townsite and Nova Scotia has also been concentrated by this company. The company either treat the ore at a rate per ton, or



Nova Scotia shaft house and concentrator.

pay for a specified percentage of the silver contents. The company have recently added to their capacity, having now fifty 1,250-lb. stamps and two Nissen 1,500-lb. stamps.

The ore is first passed through a Gates crusher and then sent to rolls, where it is reduced to ¾-inch product. From the rolls it goes through a Vezin sampler, and then through a trommel. The fines go direct to a hydraulic classifier, and the oversize to a bull-jig. The tailings from the jigs go direct to the stamps, then to a classifier, the sands going to Wilfley tables and the overflow to callow tank and vanners. The tailings from the vanners again go to a classifier, and the spigot discharge to waste, while the fine product is led over canvas tables.

Mr. M. F. Fairlie is superintendent of the mill.

Nova Scotia

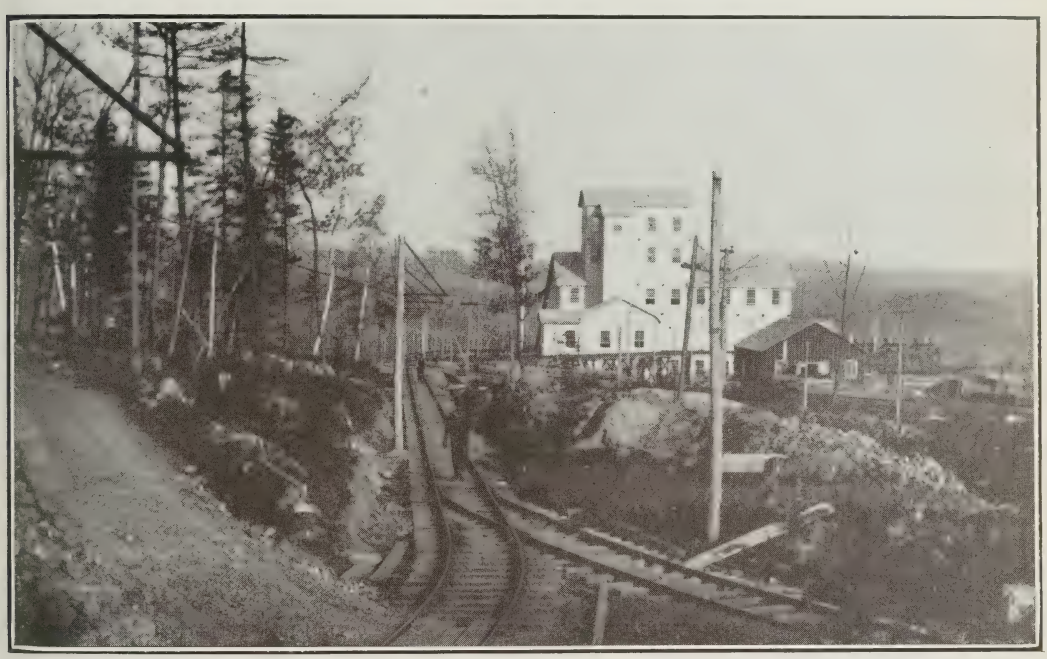
In the company's annual report the amount of underground work for the year was given as 1,977 feet of drifting, 1,619 feet of cross-cutting and 229 feet of sinking. This applied both to the Nova Scotia mine and to the Peterson lake lease. The lease is worked from the Nova Scotia shaft, and consequently the two workings are as one mine. The work done enumerated above has consisted partly of exploratory work. A drift was run from 110-foot level to cut No. 10 vein, which was discovered on the surface

just east of the office. A shaft has also been sunk on this vein to a depth of 75 feet. On the fifth level, west drift, a winze was sunk a depth of 75 feet and drift run to the shaft. The work of raising the shaft to the fifth level has begun.

The No. 3 shaft has been changed into a double compartment hoistway, which necessitated making a new manway through the older workings up No. 1 shaft. A new double drum hoist was installed.

A 20-stamp mill has been erected, and the work of concentrating ores begun in May, 1910. The mill is situated near No. 3 shaft, and the ore is first put through a crusher, over screens, and the oversize through rolls and then to the stamps. The product from the stamps is classified, and the sands run over tables. The whole product is then re-ground in two 18-foot tube mills and then cyanided. A complete equipment of agitating tanks, filter presses and precipitating tanks has been installed.

Mr. A. G. Kirby is manager.



O'Brien mill and electric railway.

O'Brien

Four shafts were being worked at the O'Brien mine in February, 1910. These were: No. 1, No. 2, No. 6 and No. 14. Shaft No. 16 was worked during part of 1909.

The workings of No. 1 shaft remain much the same as described in the last Report. The drift on the 200-foot level of No. 1 shaft has been extended east and connected with the drift west on the first level of No. 6 shaft by a cross-cut and raise. From the 200-foot level east drift, 1,000 feet from No. 1 shaft, a raise is being put through to the surface for the new shaft. This is to be a 3-compartment shaft, and is about 200 feet from the mill. Ore can be trammed underground from No. 1 and No. 6 shafts to this new shaft and hoisted to the surface, from which a short tramway will lead to the mill.

No. 2 shaft has been sunk to the 225-foot level and drifting begun.

No. 6 shaft is 240 feet deep and has levels at 75 feet, 150 feet and 225 feet. Drifts have been extended east and west from the shaft on each level and stoping commenced. From the second level a drift is being driven north to connect with the drift from No. 16 shaft.

No. 14 shaft is 185 feet deep, with levels at 110 feet and 185 feet. On the first level 100 feet of drifting has been done and on the second level 60 feet of cross-cutting.

The concentrator has been in operation since the latter part of 1909. The ore is first crushed and jigged, and then re-crushed by 30 stamps. The coarser product is then treated in tables and the finer ore crushed by tube mills and cyanided. The cyanide department consists of a pulp thickener, agitators, filters, precipitation tanks and slime presses.

Mr. M. T. Culbert is manager.

Ontario Development

The Ontario Development and Mining Company, Limited, have been engaged in development work on lot 1, in the first concession of Coleman.

A shaft has been sunk to the depth of 250 feet, with stations at 150 feet and 250 feet. About 150 feet of drifting has been done at both levels.

A plant, consisting of a 100-h.p. boiler, 3-drill compressor and hoist, has been installed.

Ophir

On the east half of the northeast quarter of the north half of lot 2, in the second concession of Coleman, the Ophir Cobalt Mines, Limited, of which Mr. E. P. Rowe is managing director and Mr. J. A. MacVichie, consulting engineer, were engaged in prospecting and development work during 1909. A shaft has been sunk to a depth of 200 feet, and levels run at 100 feet and 200 feet. On both these levels about 75 feet of drifting had been done at the time of inspection.

A plant, consisting of a 100 horse-power boiler, 6-drill compressor and hoist, has been installed.

Ore Reduction Company

This company kept their concentrator, which is situated on Nipissing property near the Kendall shaft, running most of the year on Nipissing low-grade ore from the Kendall shaft.

The scheme of concentration has been changed from dry to wet process. The mill, when in operation, treats from 60 to 75 tons per day.

Pan Silver

The Pan Silver Mining Company own the south 80 acres of the north half of lot 2, in the third concession of Coleman. Mr. B. E. Cartwright is president, and Mr. Norman R. Fisher manager.

Shaft No. 2 is 200 feet deep, and is connected with the No. 1 shaft, which is about 250 feet distant. On the second level a cross-cut has been driven south 350 feet, and a drift northwest 300 feet. A winze was sunk on this drift a depth of 50 feet at about 250 feet from the shaft.

Peterson Lake

Peterson Lake Silver Cobalt Mining Company, Limited, have 155.8 acres of their property under lease on a royalty basis of 25 per cent. of the gross value of the ore produced.

The following have leases:—Gould Consolidated Mining Company, Kerry Mining Company, Cobalt Leasers Company, Scott, Deville (St. Anthony), Little Nipissing Mining Company, Baird (Union Pacific), Brydge Syndicate (Susquehanna), Nova Scotia. The work done by these concerns will be found noted under their several names.

The company itself did no mining until the first part of 1910, when it let a contract to sink a shaft 150 feet deep.

Pontiac

The Pontiac Silver Mining Company, Limited, acquired the Flynn property near Cross lake and did some development work on it in 1909. A shaft was sunk 75 feet and some drifting and cross-cutting done.

Provincial

The Provincial mine was operated by the Ontario Government until September, 1909, when it was sold to Mr. F. M. Connell for the sum of $113,111 and possession given to him on October 6th, 1909. Since that time Mr. Connell has turned the property over to the Cobalt Provincial Mining Company.

The work done underground has been described in former Reports of the Bureau of Mines. The new company are engaged solely at No. 2 shaft, near the Savage line, which they have sunk to a depth of 100 feet.

Mr. O. N. Scott is manager.



View of Cobalt in distance—Right of Way Company's Buildings in right foreground, and Mines Power Company's transformer and compressor building on left.

Red Jacket

The Red Jacket Silver Mines, Limited, have acquired the property originally known as the Morrison, on the north-west part of the north half of lot 7 in the fourth concession of Coleman.

A shaft has been sunk to a depth of 125 feet and 300 feet of drifting has been done at this level.

A plant was installed consisting of boiler, compressor and hoist. A shaft house and ore house have been erected.

Rex Flinn

On A. 7, one of the lots on the Gillies Limit, sold by the Ontario Government, a shaft 60 feet deep has been sunk and some surface work done.

Right of Way

The Right of Way Mining Company confined their work in 1909 to the No. 3 shaft. This shaft is 75 feet deep with cross-cut of 60 feet to No. 1 vein. On this vein, which extends across the right of way, considerable stoping has been done and a winze sunk to the 120-foot level, where 125 feet of drifting has been done. The main cross-cut has been extended north on the 75-foot level, a distance of 330 feet, where No. 2 vein was

encountered. On this vein 120 feet of drifting was done and a winze sunk to the 120-foot level, where a drift was run 120 feet. The main cross-cut has been extended a further distance of 600 feet, cutting veins on which 250 feet of drifting was done. Near No. 3 vein, or 740 feet north of No. 3 shaft, a raise was put through to the surface and timbered, which is now used as a working shaft.

The work at No. 2 shaft ceased the latter part of the year. The workings remain much the same as described in the last Report. The stopes on the known veins have been worked out.

Rochester

The Rochester Cobalt Mines, Limited, were engaged in development work on their property during part of 1909. The main shaft is now 165 feet deep, with a level at 150 feet, on which 200 feet of drifting and cross-cutting has been done. On the first level about 300 feet of drifting and cross-cutting was run.

Another shaft was begun the latter part of the year about 400 feet south of the main shaft. This was sunk to a depth of 75 feet.

Mr. A. M. Carroll is superintendent.

St. Anthony

The St. Anthony Prospecting, Developing and Mining Company, Limited, have a lease on Peterson lake opposite the Little Nipissing lease on the east shore of the lake. A shaft has been sunk to a depth of 150 feet, and a small upright boiler and hoist installed. Father Joseph Zubeycki is president of the company. The directors have passed a by-law by which one-quarter of all the dividends that may be declared shall be given to charity.

St. Lawrence

The St. Lawrence Cobalt Consolidated Mining Company have been developing a claim on an island in Sasaginaga lake. A shaft has been sunk to a depth of 75 feet and some trenching and test pitting done.

Mr. W. E. Waterman is president of the company.

Shamrock

The Shamrock Silver Mining Company, Limited, have been developing the south half of the south-west quarter of the south half of lot 1 in the fourth concession of Coleman. The shaft is now 300 feet deep. On the first level 800 feet of drifting and cross-cutting has been done, on the second level 1,200 feet and on the third level 100 feet. Winzes have been sunk from the first to the second level, and from the second level to a depth of 70 feet.

On the leased lot north of the Shamrock the company have been doing considerable trenching and prospecting. A shaft was sunk to the depth of 100 feet.

Silver Bar

Very little work was done by the Silver Bar Mining Company in 1909. The work done consisted of sinking a new shaft a few feet and doing some drifting and cross-cutting. Several hundred feet of diamond drilling was also done by the company during the year, using the Government drill.

Silver Cliff

This property was sold by the original owners in June, 1909, and since that time active development work has taken place. The main adit has been driven into the hill a distance of 340 feet. On No. 1 vein, cut by the adit, 460 feet of drifting has been done south-east of the adit, and 220 feet north-west. On this vein some stoping was done, and a winze sunk a depth of 60 feet. On No. 2 vein drifts have been run south-east 260 feet, and north-west 100 feet. On No. 3 vein the drifts have been extended south-east 120 feet, and north-west 110 feet.

The company have erected a 100-ton concentrating mill. The ore is hoisted to a storage bin at the top of the mill. From this it is fed into a No. 5 Austin gyratory crusher, thence to two sets of rolls, and thence over trommels. From the trommels the ore goes to 4 jigs, the tailings from the jigs passing to a 6-foot Chilian mill for re-grinding. From the Chilian mill it goes to classifiers, and thence to 9 Traylor sand tables and 3 Traylor slime tables. The mill was put in operation in April, 1910.

Mr. A. R. Peacock is president and Mr. John J. Moore manager of the company.

Silver Cross

The Silver Cross Mines, Limited, worked steadily during 1909. The shaft was sunk to a depth of 125 feet and about 200 feet of drifting done on the 75-foot level.

The plant installed consists of a 60 horse-power boiler, 3-drill compressor and hoist. This company have been furnishing the Belmont and the E.T. Mining Company with power.

Mr. L. Brown is manager.



Temiskaming mine.

Silver Leaf

In December, 1909, the Silver Leaf Mining Company leased their holdings for five years to the Crown Reserve Mining Company, at a royalty of 25 per cent., the latter agreeing to spend the first year $20,000 and $10,000 each year thereafter for four years.

During the year most of the development work took place in the main shaft near the Crown Reserve line, and in sinking a new shaft about 400 feet north of the lake. This shaft was put down to a depth of 200 feet. It is the purpose in this shaft to sink through the diabase into the slate formation underlying it and there prospect for veins. In the main shaft 300 to 400 feet of drifting and cross-cutting has been done.

Mr. S. Cohen is manager.

Strathcona

The Strathcona Silver Mining Company continued to carry on development work on the southeast quarter of the north half of lot 10 in the second concession of Bucke during 1909. About 205 feet of drifting was done from the 75-foot level.

Susquehanna

The Susquehanna Mining Company, Limited, have a lease on the north end of Peterson lake, and were operating during all of 1909. A shaft has been sunk to a depth of 210 feet and 400 feet of drifting done under the lake.

The plant consists of a 6-drill compressor, a 100 horse-power boiler and a hoist.

Mr. E. A. Niel is president of the company.

Temiskaming

The Temiskaming Mining Company have been working during 1909 chiefly on the 250-foot and 350-foot levels. On the 250-foot level the main drift north is 240 feet in length and south 500 feet. Some 600 feet of drifting and cross-cutting have been done besides these main drifts. On the 300-foot level drifts have been run north 120 feet, and south 125 feet to the winze which is sunk to the 350-foot level. From this winze a drift has been run south-west 200 feet. From the latter two other drifts have been run north and south 120 feet each respectively. The winze has been sunk 50 feet. From the bottom of this winze, drifts have been run south-west 220 feet under No. 1 shaft and north 80 feet. Considerable stoping has been done on the 250-foot and 300-foot levels.

A concentrating mill was erected on the north-west corner of the property the latter part of 1909. The ore is taken from the ore-sorting plant at the shaft by aerial tram to the top of the mill, where, after being crushed to ¾-inch, it goes over trommels for sizing, and thence to jigs. The tailings from the jigs are re-crushed by 30 stamps. The product from the stamps goes to a classifier, and from there to tables. The tailings from the tables are re-ground on a tube-mill and are treated on slime tables. The mill is expected to handle from 80 to 90 tons per 24 hours.

Mr. B. E. Cartwright is president of the company and Mr. Norman R. Fisher manager.

Temiscaming and Hudson Bay

The Hudson Bay Mines, Limited, was organized in September, 1909, to take over the holdings of the Temiscaming and Hudson Bay Mining Company. This company have paid $1,171,911 in dividends.

The work during the year at this property was done chiefly on the third and fourth levels. On the third level, 1,450 feet of drifting and cross-cutting has been done, besides considerable stoping. On the fourth level the main drift east on the vein is 400 feet in length. From a point in this drift 140 feet from the shaft a drift has been run to the Trethewey line.

In the ore house a jig and a Wilfley table have been installed for treating the low-grade screenings.

The company have purchased some claims at Gowganda, and are doing development work on them.

Trethewey

The Trethewey Silver Cobalt Mines, Limited, have paid $461,998.50 in dividends. In addition to this the mine produced considerable ore while it was being operated by the original owner, Mr. W. G. Trethewey.

The chief work in the mine last year was done from No. 2 shaft. On the sub-level, between the first and second levels, 700 feet of drifting has been done; and on the second level, 900 feet of drifting and cross-cutting. On the third level the drift east is 168 feet in length. About 200 feet of drifting and cross-cutting has been done on this level.

No. 4 shaft, about 100 feet from the Hudson Bay line, on the north side of the property, has just been completed. It is 200 feet deep. On this level about 500 feet of work was done by the Hudson Bay Mining Company under contract, before the shaft was completed, they also having raised part of the shaft.

The 30-stamp mill being erected by the company is expected to be in operation in May, 1910. The system of concentration is very similar to other stamp mills in the camp. The ore is crushed to ½-inch product by a jaw crusher. It then goes to jigs, and the tailings from there to stamps. The product from the stamps goes to a classifier and thence to tables. A tube-mill is being used for fine-grinding the tailings from the tables. This is treated on slime tables. The mill will have a capacity of 80 to 90 tons per day.

Victoria

No work was being done by the Victoria Silver Cobalt Mines, Limited, the latter part of the year, a fire having destroyed their plant. Several shafts have been sunk to varying depths. In all, about 650 feet of shaft sinking has been done, and 750 feet of drifting and cross-cutting.

Waldman

Lots A. 10, A. 12, A. 13, A. 21, A. 22 in the Gillies Limit were purchased from the Ontario Government in 1909 and have since been operated by the Waldman Silver Mines, Limited, with Mr. C. A. O'Connell as manager.

On A. 22 a discovery was made and a shaft sunk to a depth of 85 feet. A level was run at 75 feet on which drifts were driven east 25 feet and west 400 feet. Cross-cuts were extended north 40 feet and south 75 feet. Some stoping was done east of the shaft.

A shaft house and ore house have been erected and a 10 x 12-inch hoist installed. Air has been bought from the Provincial mine and from the Wyandoh. A considerable amount of trenching has been done on all the lots.

Webb

On A. 2 in the Gillies Limit a shaft has been sunk to a depth of 50 feet and some trenching done.

Wyandoh

The Wyandoh Silver Mines, Limited, have acquired lots A. 15, A. 23, A. 26, and A. 39 in the Gillies Limit.

On lot A. 23, which was purchased from Messrs. Young and O'Brien, a shaft has been sunk a depth of 100 feet and some drifting done.

A power plant, consisting of two 80 horse-power boilers, a 6-drill compressor and hoist, has been installed.

Dr. Milton Hersey is president of the company and Mr. B. Neilly engineer in charge.

Yorke-O'Brien

On A. 6 a shaft has been sunk to a depth of 150 feet, with 40 feet of drifting on the 100-foot level. The property adjoins the Red Jacket.

South Lorrain Silver Mines

Considerable interest was shown in the South Lorrain area in 1909, caused partly by the shipment of ore from the Wettlaufer mine. Other discoveries of interest were made during the year, and as a result active development work is being carried on at a number of properties.

Bellellen

This property was originally known as the Newman, and was taken over from the original owner the latter part of 1909.

Considerable trenching had formerly been done on this claim. The present owners, under the direction of Mr. Norman R. Fisher, have sunk a shaft 75 feet and drifted 100 feet.

Haileybury Frontier

The Haileybury Frontier Mining Company are operating on the south half of H.R. 16.

Shaft No. 1 is 90 feet deep, with drifts on the 75-foot level driven south-west 125 feet and north-east 60 feet. No. 2 shaft, about 500 feet south-west of No. 1, is 110 feet deep with some cross-cutting.

Power for hoisting and drilling is being obtained from the Keeley mine.

Mr. Lawrence Brown is consulting engineer.

Haileybury Silver

The Haileybury Silver Mining Company sold the south 20 acres of H.R. 16 in 1909 to the Haileybury Frontier Mining Company.

Some sinking had been done by them on this part of the lot. On the north 20 acres the mining work has consisted chiefly of sinking a shaft 100 feet deep and drifting 25 feet on this level. The surface work consists of trenching.

Mr. Cyril T. Young is president of the company.

Keeley

The first discovery of silver in South Lorrain was made on this property. Work has been carried on continuously here since the fall of 1907.

No. 1 shaft is now at a depth of 150 feet, with levels at 65 feet and 135 feet. On the first level drifts have been run east 150 feet and west 150 feet and some stoping done. On the second level, drifts have been driven 75 feet east and west respectively. Shaft No. 3, about 600 feet south of No. 1, is 70 feet in depth.

The plant consists of a gas producer, one 150 horse-power gas engine to drive the compressor of 10-drill capacity, a 40 horse-power high-speed gas engine driving a 40 kilowatt generator, electric hoist and electric pump at the lake about 2,300 feet distant.

Maidens

The Maidens Silver Mining Company have been operating claim H.R. 70, which is situated about one mile north-west of the new government dock.

In addition to trenching and test pitting, two adits have been driven, No. 1 having a length of 285 feet and No. 2, 225 feet.

Jowsey-Woods

Messrs. Jowsey and Woods have been operating on claims H.R. 21 and 22, lying west of and adjoining the Keeley mine. A shaft has been sunk to a depth of 110 feet and, on the 75-foot level, 75 feet of drifting done.

Little Keeley

On the claim west of the Haileybury Silver claim, Mr. Charles Keeley has been doing development work. In addition to surface work, a shaft has been sunk 75 feet and 50 feet of drifting done.

A boiler and hoist have been installed.

Wettlaufer

The Wettlaufer mine is the largest producer in South Lorrain. Active work was begun about the first of 1909.

A plant was installed consisting of two 60 horse-power boilers, a 5-drill straight line compressor and hoist.

The main shaft is 150 feet deep, with first level at 65 feet and second level at 140 feet. On the first level on No. 1 vein, drifts have been run south 190 feet. No. 2 vein

is cut by a cross-cut from the shaft 79 feet in length. On this vein some 200 feet of drifting has been done. It joins No. 1 vein about 100 feet southwest from the shaft. On the second level the drift southwest from the shaft is 300 feet in length and is driven northeast 175 feet. At a point 75 feet southwest of the shaft a winze is being sunk having a depth at date of inspection of 32 feet. No stoping of any amount has been done.

Mr. A. C. Bailey is superintendent.

Elk Lake Area

A number of the prospects in this area were not inspected during 1909. Some of the properties on which considerable work was done have recently ceased operations. The only property that shipped ore in any quantity is the Lucky Godfrey. A carload was sent out from this mine during the early part of 1910. A number of the prospects will not be mentioned in this Report, as there has been no opportunity as yet to inspect them.

British American

Some work was done on this property which adjoins the Otisse, but all work had ceased at the time of my inspection.

Big Six

The Big Six Silver Mines, Limited, have been operating a property about one mile northwest of the town of Elk Lake. A shaft has been sunk to a depth of 194 feet, and on the 100-foot level 60 feet of drifting done.

The plant consists of two 50 horse-power boilers, a 3-drill straight line compressor and hoist.

Mr. A. Keys is manager.

Devlin

The Devlin Mining Company have been carrying on mining operations on the northeast quarter of the south half of lot 1, in the first concession of James.

No. 1 shaft has been sunk to a depth of 100 feet, and on this level 125 feet of drifting and cross-cutting done. No. 2 shaft has been sunk 50 feet, and No. 3 shaft 20 feet. In addition to this, considerable trenching and stripping has been done.

A plant was installed on this property during the early part of 1910.

Elk Lake Discovery

Work was carried on by the Elk Lake Discovery Mining Company during part of 1908 and 1909, but all work ceased in the latter part of 1909. A shaft was sunk to a depth of 150 feet and a drift run north-east 75 feet and north-west 287 feet. Some test pits were also sunk.

The plant consists of two 50 horse-power boilers, a 6-drill compressor and hoist.

Gavin-Hamilton

The Gavin-Hamilton Mining Company went into the hands of a receiver the latter part of 1909.

A shaft had been sunk to a depth of 160 feet and drifts run east 95 feet and north 100 feet.

The plant consists of an 80 horse-power boiler, a straight line compressor and hoist.

Langham

The Langham Mining Company have been operating on a claim adjoining the Gavin-Hamilton. Considerable surface prospecting has been done and a shaft sunk to a depth of 60 feet.

Lucky Godfrey

On the claims in the southeast corner of the township of James, the Lucky Godfrey Silver Mining Company have been carrying on development work. A car of ore was shipped from these claims in March, 1910.

A shaft was sunk 50 feet and an open cut carried along the vein from which the ore was obtained.

A plant was purchased in March, 1910, but owing to the early break-up of the roads it did not reach the property.

Motherlode

The Motherlode Mining Company have been carrying on work in the northwest quarter of the south half of lot 8 in the sixth concession of James, about one and a half miles northwest of the town of Elk Lake. An adit has been driven 365 feet, a raise put up 25 feet and a winze sunk 50 feet on the vein. Near the mouth of the adit a shaft has been sunk a depth of 100 feet. Hoisting is done by horse whim.

Moose Horn

The Moose Horn Mines, Limited, carried on work steadily during last year. The main shaft has been sunk to a depth of 125 feet, and about 250 feet of drifting and cross-cutting done.

Otisse

The Otisse Mining Company have been working steadily on mining location E.B. 21 near Silver lake. Early in 1909 a plant was installed consisting of two 80 horse-power boilers, 10-drill compressor and hoist.

The main shaft has been sunk a depth of 150 feet. On the 75-foot level about 600 feet of drifting and cross-cutting has been done, and on the 150-foot level about 150 feet.

Mr. C. C. Williams is superintendent and Mr. F. C. Loring managing engineer.

Otisse-Currie

This mine is west of and adjoining the Otisse. It was in operation during part of 1909, but the company went into a receiver's hands the last of the year.

A shaft was sunk to a depth of 100 feet and about 250 feet of drifting was done.

Tee Arr Mining Company

On this claim, situated about three miles west of Elk Lake near the road to Gowganda, considerable development work has been done. Two shafts have been sunk to depths of 75 feet and 50 feet respectively, and about 100 feet of drifting done.

Silver Alliance

The Silver Alliance Mining Company carried on mining work during 1909. No. 1 shaft has been sunk to a depth of 100 feet and 200 feet of drifting and cross-cutting done.

Power was obtained from the Elk Lake Discovery Mine.

Tudhope

Adjoining the Silver Alliance property, the Tudhope Silver Mining Company have done considerable development work. One shaft has been sunk to a depth of 300 feet and some drifting and diamond drilling done.

Maple Mountain Area

On a number of claims in this area the assessment work was done, and on a few some underground development.

The property on which the greatest amount of work has been done is the White claim.

White

The White Reserve Mines, Limited, were operating on claim R.S.C. 56 until the first part of 1910, when the company ceased work owing to financial difficulties.

The work done consisted of sinking a shaft to a depth of 140 feet. On the 75-foot level a cross-cut was driven south 200 feet to cut vein No. 7, and 100 feet of drifting was done on this vein. On the second level a cross-cut was driven north 125 feet. On vein No. 21 an adit was run a distance of 200 feet. Six and a half tons of ore were shipped in 1909.

Gowganda Area

Considerable development work has been done on a large number of claims that were not inspected. The new government road from Elk Lake to Gowganda will materially help in the development of the camp during the present year. In 1909 the cost of supplies when landed in Gowganda was excessive, as everything taken in during the summer had to be carried by canoe, and there were a large number of portages on the water route between Elk Lake and Gowganda.

The location of these properties is shown on the geological map of Mr. A. G. Burrows, which accompanies Part II. of this Report of the Bureau of Mines.

Bartlett

The Bartlett mine ceased operation the latter part of 1909, owing to financial difficulties.

The work done up to the middle of October consisted of sinking No. 1 shaft to a depth of 115 feet. On this level cross-cuts were run north 135 feet and south 135 feet. About 1,000 feet southwest of No. 1 shaft, No. 2 shaft has been sunk to a depth of 110 feet, and some drifting done.

The plant consists of two 80 horse-power boilers, a 12-drill compressor and hoists at both shafts.

Mr. A. S. Stevens was superintendent.

Boyd-Gordon

This mine was inspected in October, 1909, and in March, 1910. The shaft has been sunk to a depth of 150 feet. On the 75-foot level cross-cuts have been driven north and south each a distance of 140 feet, and about 150 feet of drifting was done on the veins. A sub-level has been run at a depth of 40 feet and some stoping done.

The plant consists of two 50 horse-power boilers, a 6-drill compressor and a hoist.

Bishop

The Bishop Silver Mines, Limited, have been working on T.C. 136, and doing assessment work on a number of other claims. On the above lot a shaft has been sunk to a depth of 65 feet.

Everett

The Everett Lake Mining Company and the Le Heup Mining Company carried on considerable prospecting work on their claims near Everett lake in 1909. A number of test pits were sunk and trenches run.

Bonsall

Messrs. Sifton and O'Brien carried on mining operations during the greater part of 1909 on the Bonsall claims, R.S.C. 82, 83 and 84, which lie north of the Millerett. The main shaft has been sunk to a depth of 135 feet, with about 25 feet of cross-cutting on this level. On the 30-foot level, a drift was run east 80 feet and a drift on a cross-vein 60 feet. On the 75-foot level 50 feet of drifting has been done. No. 2 shaft, on the south side of the property, is 50 feet deep with some drifting.

The plant consists of two 50 horse-power boilers, a straight line compressor and hoist.

Mr. F. P. Aylwin is manager.

Gates

This property consists of claims R.S.C. 90 and 91, lying south of the Millerett. No. 1 shaft is 95 feet deep, with a 25-foot cross-cut driven from the bottom of the shaft. On the 65-foot level, a drift was run north 65 feet and south 48 feet. No. 2 shaft is 65 feet deep with a drift south 54 feet and a cross-cut east 15 feet.

The plant consists of two 50 horse-power boilers, a 6-drill compressor and two hoists.

Mr. K. D. Woodworth is superintendent.

Jacques

The property adjoins the Bartlett to the south. No work was being done on it at the time of inspection. Two shafts were sunk to depths of 35 and 40 feet respectively.

La Brick

The La Brick claims adjoin the Mann property on the east. Two shafts were sunk to a depth of 40 and 45 feet respectively during the summer of 1909. Work was resumed on the claims in March, 1910, under the direction of Mr. O. Henry.

Le Roy

The Le Roy Lake Syndicate have been prospecting on a number of claims near Le Roy lake.

No. 1 shaft has been sunk 100 feet. No. 2 shaft is 45 feet deep. Near this shaft two diamond drill holes have been put down, one 165 feet deep and the other 492 feet. No. 3 shaft, near the Morrison claim, is 35 feet deep.

Mr. W. R. Asquith is manager.

Miller Lake

The Miller Lake Syndicate had a large gang at work during 1909 prospecting their claims between Miller and Everett lakes. A large amount of trenching was done, and some shafts sunk to depths of 35 to 50 feet.

Mann

The Mann Mines, Limited, have been engaged in development work on H.R. 251 and 252. The main shaft has been sunk 75 feet deep with a drift east 125 feet, and a cross-cut north 140 feet. A little open cutting has been done on this vein. Two other shafts have been sunk to depths of 40 and 50 feet respectively. During the summer systematic trenching was done on the claim.

Mr. A. L. Winckler is superintendent.

Millerett

The Millerett Silver Mining Company, R.S.C. 95, have been the largest shippers in the Gowganda area. The first work done was driving an adit on the vein. This has a length of 195 feet, and 85 feet of the vein above the adit has been open cut. The vein dips to the west at an angle of about 25 degrees from the vertical. Shaft No. 1 is sunk vertically near the mouth of the adit to a depth of 83 feet. The level is at 70 feet and drifts have been run southwest 290 feet and northeast 150 feet. A raise has been put through from this level to the adit level on the vein, and a winze sunk a depth of 40 feet. Stoping is being carried on between the adit level and the first level. From the adit level a cross-cut has been driven west to No. 2 vein a distance of about 150 feet. No. 2 shaft is 60 feet deep, with drifts run north 55 feet and south 145 feet on the 50-foot level. Several prospect pits have been sunk to depths of 10 or 12 feet and considerable trenching done.

The plant consists of three 50 horse-power boilers, two 3-drill straight line compressors, 2-feed water heaters, 2 hoists and pumps.

Mr. G. M. Colvocoresses is manager, employing an average of 60 men.

Mackay

The Mackay property adjoins the Morrison on the south and is about 3½ miles east of Gowganda lake.

A shaft has been sunk to a depth of 80 feet and about 50 feet of drifting done at the 50-foot level.

Mr. C. B. Flynn is manager.

Morrison

The work done on this claim consists chiefly of trenching. A test pit about 10 feet deep has been sunk on the main vein. The property is owned by Major Morrison of Ottawa and associates.

O'Kelly

This property adjoins the Jacques on the east. The work done during 1909 consisted chiefly of trenching and test pitting.

Reeves-Dobie

This mine is being operated by the Gowganda Pilot Silverlands, Limited, with Mr. J. G. Harris as manager.

Two cars of ore were shipped from the property during the winter, constituting it the second largest shipper in the Gowganda area. A shallow open cut was carried along the vein from which the ore was obtained. The main shaft has been sunk to a depth of 65 feet and a drift driven south a distance of 150 feet. In addition to this a number of test pits were sunk, and a considerable amount of stripping done.

A plant, consisting of two 50 horse-power boilers, the high pressure half of a 10-drill compressor and a hoist, has been installed.

Silvers, Limited

This property is also known as the Armstrong fraction. A shaft has been sunk to a depth of 100 feet and a drift run north a distance of 75 feet. A small boiler and hoist have been installed.

Mr. M. Kennedy is superintendent.

Transcontinental

This property is situated about two miles west of the north-west arm of Gowganda lake. A shaft has been sunk a depth of 75 feet and a small plant installed.

Welsh

This property lies south of and adjoining the Reeves-Dobie. Some trenching and test pitting was done on it during 1909, but active mining operations were begun under Mr. Moses Joy as manager in March, 1910.

Larder Lake Area

Assessment work was done on a large number of claims in this area during 1909. On some of the more important properties, considerable work was done, and on one a stamp mill was run. On account, however, of the intermittent operations throughout the whole of the camp, no inspection was made during the year.

In the townships of Munro and Guibord a number of claims were staked for gold in the fall of 1908 and some work was done during 1909. The Munro Mines, Limited, have probably done the most development work. On this property, which is in the township of Munro cornering on Guibord, a shaft has been sunk to a depth of 70 feet, and some stripping done on the vein on surface.

About five miles north of Dane and one-half mile from Swastika station, T. & N.O. railway, the Swastika Mining Company have been engaged during the last two years in developing a gold prospect. A shaft has been sunk to a depth of 100 feet and some drifting done. A two-stamp mill was installed the latter part of 1909, and some mill runs made.

Porcupine Area

In the townships of Whitney and Tisdale gold discoveries were reported in the latter part of 1909. A large number of claims were staked during the fall and winter, but very



South Porcupine.



Government Townsite, Porcupine.

little actual mining work has yet been done in the camp. Porcupine lake is central for the two townships mentioned, and on its shores three towns are already in embryo. On a hurried inspection tour in March, 1910, the following properties were inspected:

Bannerman

These claims are about one and a half miles north of Porcupine lake, and are being developed by the Scottish Ontario Gold Mining Company, with Mr. P. McLaren as manager.



Bannerman Claims, Porcupine.



Camps at Dome Mine, Porcupine,

A shaft has been sunk a depth of 22 feet and two of the veins stripped for a considerable length.



No. 1 Shaft, Timmins (Hollinger) mine, Porcupine.



Outcrop of Quartz at Timmins (Hollinger) mine, Porcupine.

Dome

No work was done on these claims other than some stripping. The claims have been taken over by the Dome Mines, Limited, and active development work begun under the supervision of Mr. John Lawson, of the Canadian Copper Company.

A plant was taken in before the break-up and is now in operation.

This property is situated about two miles west of Porcupine in the township of Tisdale.

Hollinger

The Hollinger claims are situated about four and a half miles west of Porcupine lake and a mile and a half east of the Mattagami river. They are being developed by Messrs. Timmins, McMartin and Dunlap, the original owners of La Rose mine at Cobalt.



Bagging ore for sample shipment at Timmins (Hollinger) mine, Porcupine.

On these claims the most work in the area had been done at the time of inspection. Three shafts had been sunk to a depth of 55 feet, 35 feet and 20 feet respectively. On the deeper shaft a cross-cut was being driven north and south from the 50-foot level.

A plant, consisting of boilers and compressor, was on the ground and was being set up.

A carload of ore was shipped from the property during the winter.

Miller

Some work was done on the Miller claims, which adjoin the Hollinger on the northwest, by Mr. M. J. O'Brien, who held the claims on an option. A couple of test pits were sunk, and 205 feet of diamond drilling done.

O'Brian-Foley

About one-half mile west of Porcupine lake Messrs. O'Brian and Foley have begun development work on a claim. A shaft has been sunk a depth of 25 feet, and some stripping done.

Temagami Area

In the area between Latchford and Temagami there is one mine shipping iron pyrites and two mines that have shipped mispickel and chalcopyrite. Work has been done on a number of claims for gold, molybdenite, silver and copper.

Northland

This mine was closed for a few months in 1909, but is now operating steadily. The main shaft has a depth of 300 feet, with levels at 100 feet, 175 feet and 275 feet. A winze was sunk from the second level, 75 feet north of the shaft, a depth of 100 feet, a drift run to the shaft, and the shaft raised to the second level. Underhand stoping is now being carried on from the stope between the second and third levels. No other work was being done at the time of my inspection.

Mr. L. Hanna is manager.

Sterling

No work is being done by the Grey's Siding Development Company at this property, which is situated about three miles from Grey's Siding, T. & N.O. railway. Some open cut work was done in 1909, and a quantity of ore shipped.

Temagami Gold Reef

The Temagami Gold Reef Company have been developing a property on the west side of Net lake, which carries some gold and molybdenite.

One shaft has been sunk a depth of 75 feet and another a depth of 50 feet.

Temagami Cobalt

On the east shore of White Bear lake the Temagami Cobalt Mines, Limited, have been engaged in development work on their claims. A number of shafts have been sunk, one on T.R. 1609 having a depth of 100 feet, and one on T.R. 1836 a depth of 75 feet, with some drifting.

IV.—EASTERN ONTARIO

Eastern Ontario is unique in the possession of a great variety of minerals, some of which are of rare occurrence in economic quantities. Of these minerals the following are mined and shipped: Gold, copper pyrites, talc, iron pyrites, galena, zincblende, amber mica, apatite, graphite, arsenopyrite, iron ore (both magnetite and hematite), feldspar, quartz, corundum, fluorite and barite. Sodalite also occurs near Bancroft, and a little has been taken out for use as a decorative stone. Marble, granite and limestone are quarried and used for building purposes. There is probably no better limestone for building purposes than the Birdseye and Black River limestone, which occurs in the vicinity of Kingston, from which occurrence the name Limestone City is derived.

A number of properties are, however, worked intermittently, particularly the gold properties. The first production of iron pyrites dates back only a few years, but it is now an important industry, and an acid plant has been erected at Sulphide by the Nicholls Chemical Company for treating the ore at the mine.

Eastern Ontario has for many years been a large producer of amber mica; in fact, nearly all the amber mica used in America comes from eastern Ontario and that part of Quebec north of the Ottawa river tributary to the city of Ottawa. A number of mica properties were worked between 1870 and 1890 for apatite when the price for that mineral was high. About the year 1891, on account of the discovery of large beds of animal phosphate or guano in Florida, the price of phosphate dropped so low that all the phosphate mines in Ontario had to cease operations. About the same time, however, the demand for mica began, and since that time the production of mica has been a very important industry in eastern Ontario. The market for it fluctuates with the industrial activities of America, on account of its being chiefly used in electrical machinery. This was very marked in 1907 and 1908, when, owing to the financial depression, the large

electrical companies had to curtail operations. As a consequence most of the mica mines had to cease operations for a time, owing to there being no market for their mica. Conditions have improved vastly during the last year, and the price paid for thumb trimmed mica at present is as follows:—

1″ x 1″	4 to 5 cents per pound.
1″ x 1″	8 to 10 " "
1″ x 3″	15 to 18 " "
2″ x 3″	35 to 40 " "
3″ x 4″	55 to 60 " "
3″ x 5″	75 to 80 " "
4″ x 6″	90 to 100 " "

In 1902 the value of mica produced in Ontario was $102,500, being the largest returns that have been received. This is the value of the mica in its rough condition as taken from the mines.



Open pit, Mayo iron mine, No. 4.

Corundum is another mineral which has provided an important industry for Ontario. In 1906 the value of corundum produced in Ontario was returned as $262,448. During 1909 the Canada Corundum Company leased their property to the Manufacturers' Corundum Company, who have since been operating it.

There has been a small production of talc from the Henderson mine near Madoc for some years. It was all shipped to the United States. During the latter part of 1908, Mr. Geo. H. Gillespie began the erection of a mill for grinding the talc. Since that time he has developed an important industry, necessitating the operation of the mine all the year and supplying practically all the trade demands for ground talc in Canada. The capacity of the mill has been more than doubled.

There was only a small gold production from eastern Ontario in 1909. The Gilmour Mining Company operated their mine near Gilmour for a short time, and the Golden Fleece mine near Flinton was worked intermittently on a small scale.

Iron

Mayo

The Canada Iron Corporation operated the Mayo mine, near Bessemer, under lease from the Mineral Range Iron Mining Company, during 1909 and up to May 1st, 1910, when they surrendered the lease.

Work has been confined to No. 4 shaft, which has been sunk to a depth of 120 feet. On this level drifts have been driven east 75 feet and west 100 feet. Stoping is being carried on from both sides of the shaft. On the west side the ore is being taken out by underhand stoping to the winze, which was sunk about 30 feet from the shaft. On the east side a raise has been put through to the bottom of the open pits. The open cut east of the shaft has been carried down below the first level for a length of 150 feet. The ore was shipped by way of the Bessemer and Barry's Bay railway, about five miles to the Central Ontario railway, to the company's furnace at Midland.

Rankin

This property was sold under option by Messrs. Coe and Rankin to Mr. H. H. Lang and associates. No work other than stripping has as yet been done on it.

Iron Pyrites

Sulphide

The work at this mine has been confined chiefly to the third level and below it. Some stoping has been done on the third level stope. The main shaft is only sunk to this level. From the bottom of the winze sunk on the north vein, a cross-cut has been driven to the south vein and 290 feet of drifting done on it. On the north vein on this level 360 feet of drifting has been done. On the south vein a winze has been sunk another 75 feet to the fifth level and 100 feet of drifting done. A raise was also put through to the third level on the south vein over the winze to the fifth level. This raise is to be continued to the surface, and used as a new shaft.

The ore used at the acid works, located about 500 feet from the shaft, has been largely taken out by development work.

The company have been engaged during the last few months in putting in machinery to double the capacity of the acid plant and to manufacture hydrochloric acid. Electric power is to be used to operate the machinery at the mine and acid works, being obtained from the Seymour Power and Electric Company at Campbellford.

Craig

Mr. B. A. C. Craig has been developing an iron pyrites property near Sulphide. A shaft has been sunk to a depth of 200 feet, with drifts run west 125 feet and east 90 feet on the first level, and west 25 feet and east 25 feet on the second level. Some stoping has been done on the first level, and ore shipped to the Nicholls Chemical Company's plant at Sulphide.

The plant consists of a small boiler and hoist.

Zinc

Richardson or Olden Mine

During the year the work at this mine has been confined to the new vein which lies about 400 feet northwest of the old workings. On this vein a number of test pits have been sunk and the vein open-cut at one place to a depth of 40 feet and a length of 60 feet. The ore is hauled by wagon to the mill, crushed and jigged by hand. No work has been done in the old pits during the year.

Mr. M. J. Flynn is superintendent.

Feldspar

Richardson Mine

The Kingston Feldspar and Mining Company shipped steadily from their mine during 1909. During the winter of 1909-10 a considerable tonnage of quartz, which occurred as a capping over the feldspar in the central part of the pit, was removed and shipped to Welland, where it is used in the manufacture of ferro-silicon. The removal of the quartz will combine the workings into one large open pit, and make accessible a large tonnage of feldspar. The same system of mining and haulage as described in former Reports is used.

Talc

The only producing talc mine in Ontario is situated about one-half mile east of Madoc on lot 14, in the fourteenth concession of Huntingdon. The mine has been worked almost continuously for the last year, under the direction of Mr. S. Wellington. Operations in the open pit were suspended during the winter, and since that time the talc has been obtained from open cutting the deposit to the east of the old open cut. A new shaft to the west of the old workings has been sunk 140 feet and timbered.

Talc Mill

Geo. H. Gillespie and Company have built a mill for fine grinding talc near the Grand Trunk station at Madoc. The crude talc is obtained from the above mine. The capacity of the mill has been recently doubled, so that from 16 to 20 tons of finished talc are produced every twenty-four hours. Electric power is now used for driving the machinery, being obtained from the Seymour Power and Electric Company.

The ground talc is used largely in the paper trade.

Mica

Lacey Mine

The Loughborough Mining Company worked the Lacey mine continuously during the year. During the summer the open cut north of the air shaft was sunk to the first level of the mine. This open cut is about 75 feet long by 60 feet wide. During the winter the work was confined to the deposit south of the old workings and parallel to them. On this a drift has been run 200 feet, and a stope carried 35 feet in height. Some diamond drilling was also done here.

The Loughborough Mining Company also operated the Hanlan mine near Perth for part of the year, but it was closed down and abandoned late in 1909. The workings had been carried to a depth of 175 feet and for 200 feet in length.

Mr. G. W. McNaughton is manager for the company.

Tully

On lot 9 in the fifth concession of Burgess, Mr. Edward Smith has opened up a mica prospect. A number of test pits have been sunk on this property to depths varying from 5 feet to 40 feet, and a quantity of mica has been taken out.

The Silver Queen property on lot 13 in the same concession has been closed for about a year, owing to legal difficulties regarding the title.

Mica Prospects

On lot 1, in the eleventh concession of Loughborough, Mr. H. Richardson, of Kingston, has been developing a mica prospect. One pit has been sunk to a depth of 45 feet and stoped out for a length of 75 feet. Another pit was sunk to a depth of 50 feet.

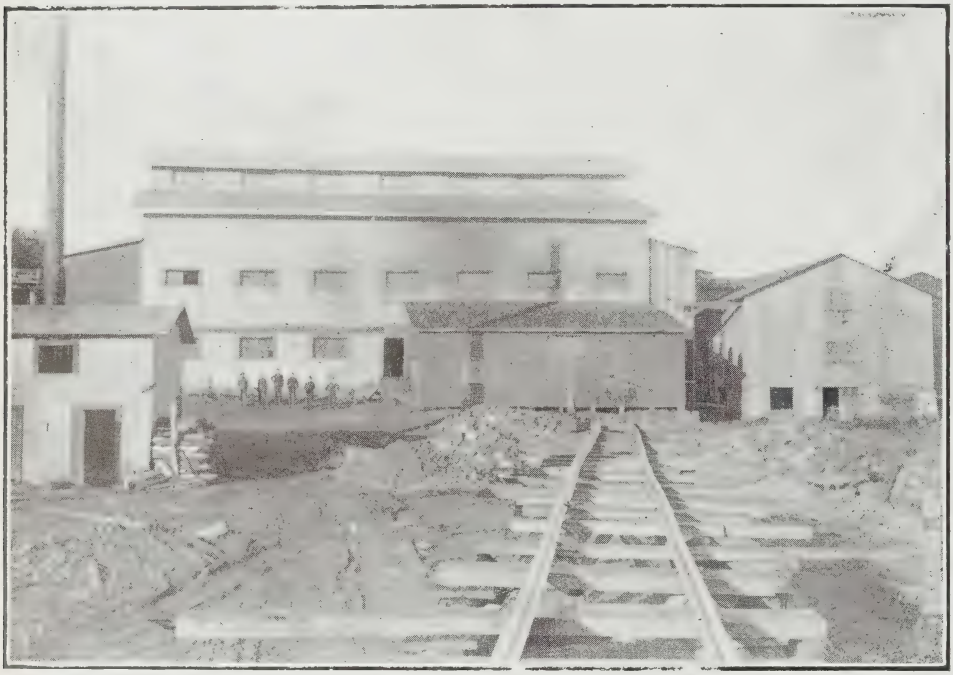
On the north part of lot 6, in the eighth concession of Loughborough, Messrs. Scriven and Whyte have been mining mica for some months. A shaft has been sunk to a depth of 45 feet, and about 25 feet of drifting done on the vein east and west from the shaft.

A small boiler and hoist have been installed.

Messrs. Stoness and Kent have worked part of the year on their property on the west side of Bob's lake.

On the Amey property on lot 7 in the ninth concession of Loughborough, some work was done early in 1910.

Mr. Rinaldo McConnell worked a mica property on the northwest side of Otty lake during the winter of 1909. The Kent Bros. of Kingston also did some development work near Otty lake.



Black Donald Graphite Company.

Mica Trimming Works

The following firms are engaged in trimming and thin splitting mica in Ottawa:—General Electric Company, Laurentide Mica Company, Eugene Munsell and Company, Wallingford Mining and Mica Company, Mr. R. Blackburn, Mr. S. O. Fillion, Mr. N. Holland; and in Kingston, Kent Bros.

Graphite

For a number of years there has been a small and irregular production of graphite in Ontario. During the last year the production of both flake graphite and amorphous has been steady, and the outlook for the graphite industry in Ontario is very favorable.

Black Donald

The Black Donald Graphite Company were operating the Black Donald mine near Whitefish lake during 1909. The mine was only worked about three months during the year, but the mill was run continuously. The mine was reopened in June, 1910. Graphite is mined during the summer months to keep the mill in operation during the whole year.

The mining work is being carried on in the open pit on the shore of the lake. This open pit is 80 feet deep and 175 feet in length. Stoping is being carried on, in the north

end of the pit, where the stope is being carried back under the coffer dam which was built some years ago to protect the workings.

Power for the mine and the mill is developed at the Madawaska river, two miles distant.

The graphite is concentrated and refined at the mill at the mine and shipped by wagon to Calabogie, 14 miles distant, for shipment to the consumers.

Mr. R. F. Bunting is manager and Mr. Geo. W. Stewart superintendent.

McConnell

Mining was carried on during the greater part of the year by the Globe Refining Company, near Port Elmsley.

The concentrating mill at Port Elmsley, three miles distant from the mine, was in operation and treated the ore from the mine. Some changes were made in the mill in the method of concentrating and refining the graphite.

At the mine the shaft was sunk to a depth of 50 feet and stoping carried on both east and west of the shaft for a distance of 75 feet in each direction. The ore is hoisted by skip, dumped into a pocket and hauled by wagon to the mine.

Mr. C. Meech is superintendent, employing a force of 30 men at the mine and mill.

Corundum

Manufacturers' Company

The Manufacturers' Corundum Company have operated under lease the mines and plant of the Canada Corundum Company during the year. The mill has been run full capacity on day shift.

The ore has been obtained from the hill near the mill on which all the corundum has formerly been obtained and from a pit known as the Klondike on the west end of the hill, about one mile from the mill. Here the ore is being quarried by open cut work and hauled in wagons to the mill. On the main hill four pits are being worked, these pits varying in depth from 10 to 35 feet.

No important change has been made in the system of concentration.

The ore is sold chiefly to the abrasive wheel and paper makers in the United States.

Mr. D. A. Brebner is manager, employing a force of 125 men.

Ashland Emery and Corundum Company

On lots 15 and 16 in the thirteenth concession of the township of Carlow the above company have been mining corundum-bearing rock and shipping it to their mill, about half a mile distant, for concentration. The corundum milled during the year has been mined from two open cuts. The largest of these two open cuts is about 150 feet in length, 40 feet in width and an average of 35 feet in depth. The other is about half the dimensions.

The same system of concentration is employed as was described in former Reports of the Bureau of Mines. The ore is crushed and sized, then passed over Wilfley tables, the heads from these tables being then further concentrated on Hooper air jigs. The iron is taken out by passing the concentrates over a magnetic separator.

Mr. W. Mackie is in charge of operations.

Feldspar

McDonald

On lots 4 and 5 in the tenth concession of Portland the McDonald Feldspar Mining Company have been engaged during the year in mining feldspar and quartz. On lot 4 an open cut has been made on the deposit for a length of 300 feet and a depth of 50 feet. On lot 5 the feldspar has been taken from an open cut 100 feet long, 50 feet wide and 20 feet deep. Both feldspar and quartz are being shipped, the former to East Liverpool and the latter to Welland.

Small boilers and hoists have been installed at both properties and hoisting done by derrick.

The properties are situated about two miles from the Kingston and Pembroke railway near Verona.

Mr. R. R. Gamey is president of the company and Mr. E. H. Snook superintendent, and about 40 men are employed.

Card Mine

On lot 16 in the eleventh concession of the township of Portland, about two miles west of Verona, the Kingston Feldspar and Mining Company have been engaged mining feldspar. This property was worked in 1905 and 1906 by the Kingston Mining and Development Company, and was purchased by the present owners in 1909 and has since been operated by them. The feldspar is mined by open cut work. This open cut is 200 feet long, 30 feet wide and 25 feet deep. The ore taken out has been stock-piled at the mine.

WATER POWERS FOR WORKING MINES

By E. T. CORKILL

The importance to the mining industry of this Province of the plentiful supply of water power found in northern Ontario has more than once been referred to in the Reports of the Bureau of Mines.[1] When a mine is opened in northern Ontario the fuel first employed is naturally wood, which is abundant over practically the whole of the territory, and which usually suffices for steam production during the earlier stages of development and operation. For the most part, however, the wood consists of jack pine, tamarac, balsam and the other smaller conifers, together with birch and poplar, which varieties are not well suited for fuel purposes, their lasting properties being poor; and if the workings are at all extensive the area of wooded territory tributary to the mine speedily becomes exhausted, and wood must be brought from so great a radius as to make it too expensive for use. If the mine is near a railway, coal is then resorted to, and in many of the mining camps in Ontario coal soon displaces wood. Cobalt was a notable example of this. Should mining operations give promise of permanency, resort is then had to water power, the initial expense of introducing which is usually considerable, but which in the end is much cheaper than steam power produced by the combustion of either wood or coal.

Fortunately, the essential condition for water power exists in every mining camp in the Province, namely, falling water sufficient in volume and descent to warrant the conversion of its energy into the electric current. This stage the mining industry has reached in several important fields. For instance, in the nickel-copper mines of the Sudbury region, both the chief producing companies now operate their mines and works by electricity generated by water power, the Canadian Copper Company at the High Falls of the Spanish river, and the Mond Nickel Company at Wabageshik Falls on the Vermilion. The steam plants formerly used by these companies are now simply kept in reserve, in case of accident or interruption of the electric power. The Michipicoten iron region is now likewise supplied with power from the High Falls of the Michipicoten, which hoists the ore and lights the workings of the Helen mine. The low-grade gold ores of the same region also share in this advantage.

During the last year several water powers have been undergoing development for use in the mines of Cobalt. Two of these are situated on the Montreal river, at Ragged Chutes and Hound Chute respectively, and one at the foot of Bass lake, on the Matabitchouan river, which stream empties into lake Temiskaming a few yards from the mouth of the Montreal.

In eastern Ontario, water power developed on the Madawaska river is used at the Black Donald graphite mine in Brougham township, and more recently the energy from the surplus water on the Trent river at Campbellford has been conveyed by electric current to the reduction works of the Deloro Mining and Reduction Company at Deloro, and is now being taken to the mine and acid plant at Sulphide. If the new gold field of Porcupine proves to be permanently workable, there will be no difficulty in harnessing the falls on the Mattagami, Grassy and other rivers within convenient reach for use in the mines. The same is true with regard to the silver mines of Gowganda and the gold veins of Larder lake.

In Michipicoten District

Algoma Power Company

At High Falls, on the Michipicoten river, about 15 miles from Michipicoten harbor, on the north shore of lake Superior, the Algoma Power Company completed the installation of a power plant in 1907, and have since that time been supplying electric power to the mines in the Michipicoten area.

[1] See 7th Rep. Bur. Min., pp. 251-6; 14th do., p. 10; 15th do., pp. 13, 14, 62, etc.



Michipicoten Power Company, High falls, Michipicoten river, showing power house and penstock.

The effective head of water at the falls is 128 feet, giving a total amount of power capable of development of about 7,000-h.p. The bulk head is fitted with an opening for a 10-foot penstock, but only a 7-foot wooden penstock has yet been constructed. One unit consists of a horizontal turbine of 700-h.p., 600 r.p.m. direct coupled to a 450 k.w. generator. Another unit has been installed, consisting of a 1,000-h.p. turbine direct connected to a 600 k.w. generator. The three-phase current is stepped up from 2,200 volts to 10,000 volts, at which voltage it is delivered to the lines. The power house is built of concrete. The chief market for power is at the Helen iron mine. Three of the gold mines, namely, the Grace, Norwalk and Kitchegammi, have power lines to their plants, and have been using the power intermittently. Mr. D. B. Detweiler, of Berlin, is president of the company.



Power development at High Falls, Michipicoten river

In the Cobalt Silver Camp

Cobalt Hydraulic Power Company

The Cobalt Hydraulic Power Company has constructed the largest one-unit air compressor in the world at Ragged Chutes, on the Montreal river, about nine miles south of Cobalt. This plant operates on the Taylor system, whereby the air is compressed by the direct action of falling water. At Ragged Chutes there is a drop of 54 feet in the river in a distance of 1,000 feet. The whole head is utilized, and furnishes 5,500 horse power, which will compress 40,000 cubic feet of free air per minute at a pressure of 120 pounds per square inch. The air pressure is automatically reduced to 100 pounds per square inch when delivered to the various Cobalt mines, in order to insure a constant pressure regardless of any loss in the main transmission lines.

After passing through the gates the water flows through two 16-foot diameter intake heads. In each of these heads there are sixty-six 14-inch diameter pipes set in a steel disc. Below the pipes the heads gradually diminish in diameter until they become 8 feet 4¾ inches, and from this point they are 15 feet long. In this telescopic form the heads connect with the intake shafts, which are 8 feet 6 inches in diameter and 345 feet deep, with the orifice of the head at the surface of the water. This arrangement permits the heads to be raised or lowered, to conform to the level of the water in the forebay, or the heads may be raised above the level of the water by air lifts, thus cutting off the supply completely. The two air-lift cylinders act as governors, automatically raising and lowering the heads which are suspended from them by the hangers, thereby regulating the flow of water into the intake pipes, according to the demand. The head pieces were especially designed to meet conditions due to extremely low temperature. The gate is raised by rack and pinion, and there is the usual rack to prevent floating material from entering the head-pipes.

The water with the entrained air flows through the heads with a descending velocity of 15 to 19 feet per second, gradually diminishing in the velocity of fall, owing to the compression of the volume of air; finally, there is a further reduction in velocity owing to the enlarged section of the last 40 feet of fall. By the time the water reaches and strikes the steel-capped concrete diverting cones its velocity is so diminished by the baffle from the compressed air that there is little shock.

The cones are for the purpose of spreading the flow of air and water, thereby bringing the air nearer the surface as the water starts to flow through the tunnel. The density of the air being less than that of water, it rises to the surface of the latter under a pressure of 120 pounds per square inch. The tunnel was made 20 feet wide, 26 feet high and 1,000 feet long, for the purpose of utilizing the total head of the stream, although this length was not necessary in order to give the air time to leave the water before the latter starts up the outlet shaft. As the velocity of the water in the tunnel is about three feet per second, practically all the air will leave the water in the first 300 feet. The last 75 feet of the tunnel has the height reduced to 16 feet.

The pressure given to the air is due to the height of the body of the water in the outlet shaft, which in this case is 298 feet deep and 22 feet in diameter. The water flows along the tunnel and up the outlet to the river, the difference in elevation between the mouth of the intake and the discharge tunnels being 47 feet. Near the outlet end of the tunnel its height is increased to 42 feet, and at this place two pipes are carried through a 30-degree rise to the uptake shaft. One pipe, 24 inches in diameter, carries the compressed air to the surface, where it is connected with the 20-inch air main pipe line. The other pipe is 12 inches in diameter, and has its end submerged at a safe distance above the roof of the outlet portion of the tunnel, in order to act as a blow-off in case the air in the tunnel should acquire such pressure as to force the water below the level of the tunnel outlet. If the air were allowed to escape up the outlet it would lighten the column of water in that shaft, and the air pressure would not be constant. The blow-off pipe ends at the upper level of the water in the outlet shaft, its end remaining open to the atmosphere. When the volume of air is greater than the demand, the air accumulates in the upper part of the tunnel, forcing the water down and exposing the lower end of the blow-off pipe to the compressed air, thus allowing a portion of the water in this pipe to drop back, thereby decreasing the weight of the remaining water in this pipe to less than the pressure of the air. The equilibrium is now overcome, and the water in the pipe is driven upwards to the surface, where a most spectacular sight is witnessed, as a body of water is shot out by the air sometimes to a height of 500 feet. The blow-off continues until the pressure of the air in the tunnel is sufficiently reduced to again submerge the end of the pipe. Water now rises until an equilibrium is established between the air and water pressure in the tunnel. The air pipe and blow-off pipe are packed in concrete the entire length of the 30-degree raise, in order to seal them and prevent any escape of air up the outlet shaft. These arrangements permit the delivery of a large body of air at a constant pressure at all times.

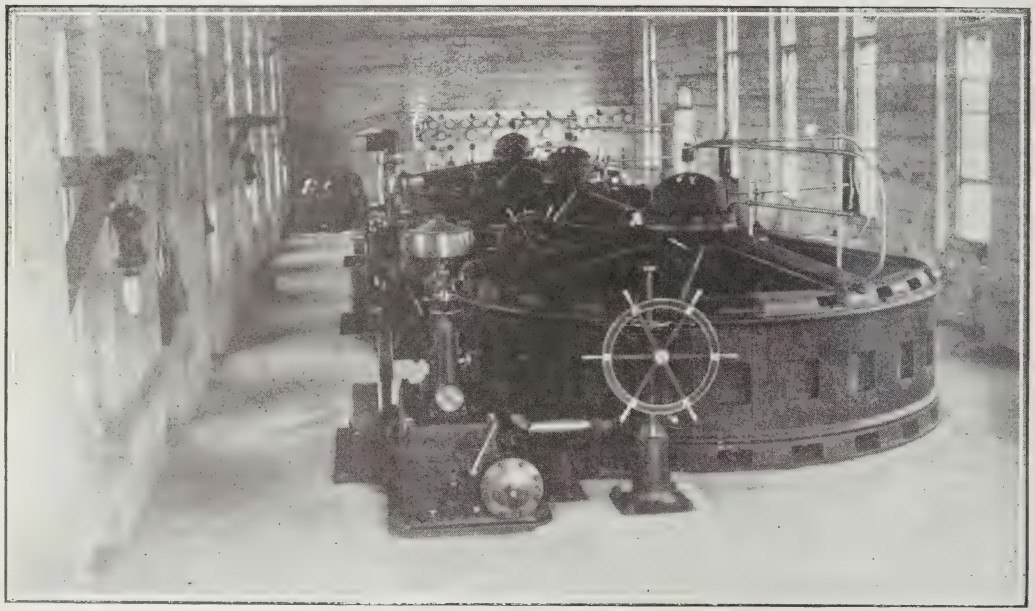


Blow-off at Cobalt Hydraulic Power Company's plant on Montreal river.

The air is transmitted through nine miles of 20-inch diameter pipe, from the end of which there are two 12-inch diameter branch pipe lines. At a point about seven miles from the compressor there is another 12-inch diameter branch pipe line, so that the total length of 20-inch, 12-inch, 6-inch and 3-inch diameter pipes is about 21 miles.

Much care has been taken in the installation of the pipe lines to prevent leaky joints and strains on the pipe. In the 20-inch and 12-inch diameter pipe lines, balanced expansion joints have been placed at half-mile intervals, and half-way between each two expansion joints the pipes are anchored in massive concrete piers to prevent their creeping.

The compressed air is supplied by meter to the larger consumers for 25 cents per thousand cubic feet at 100 pounds pressure and atmospheric temperature.



Generators, governors and exciters, Cobalt Power Company.

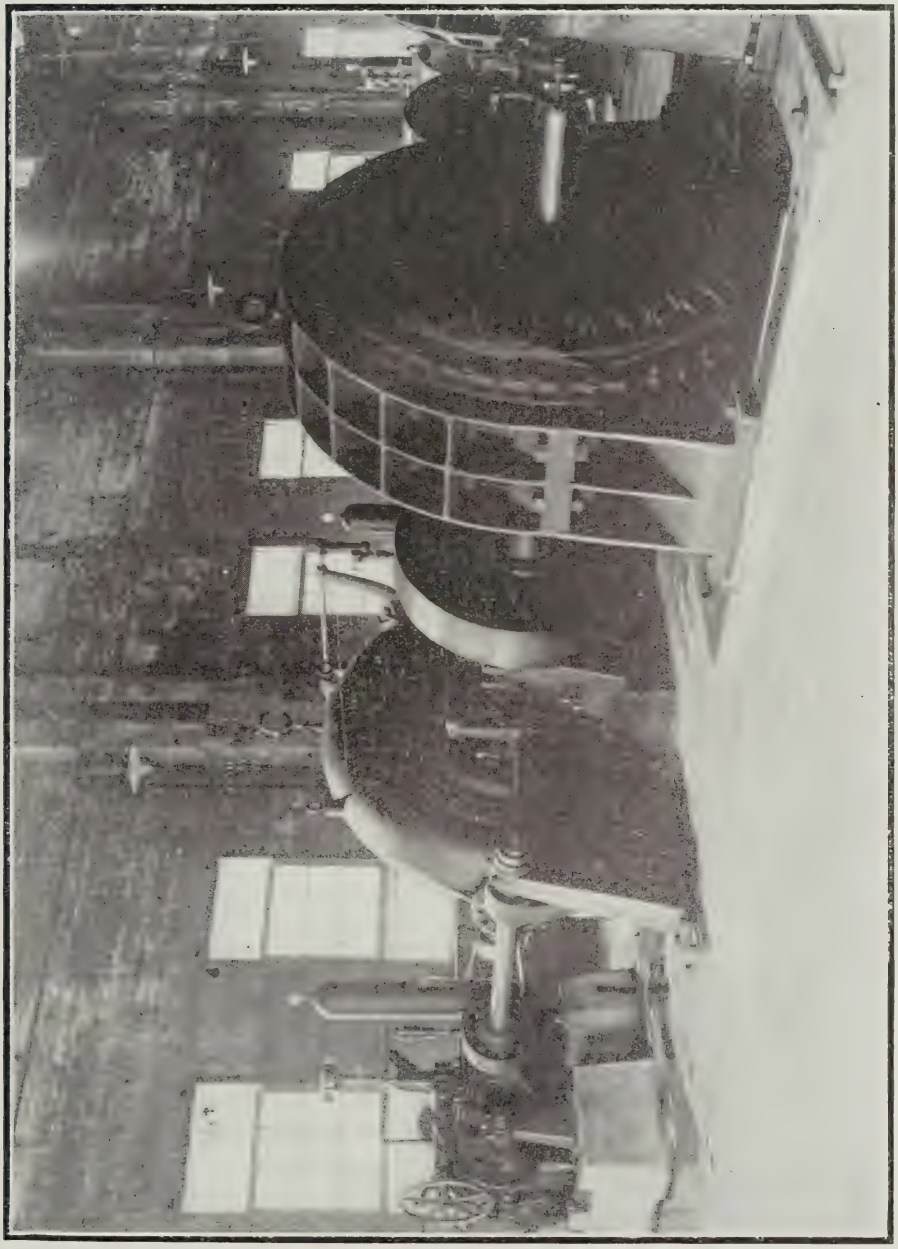
To the smaller consumers the following rates will be charged per drill per 10-hour shift:—

1 Drill	$5.00	each
2 Drills	4.00	"
3 "	3.50	"
4 "	3.10	"
5 "	2.83	"

At Ragged Chutes an electric power plant has been installed. The turbine is belted to a 400 k.w., 2,300 volt, 3-phase, 60-cycle generator. This power is sold to the Cobalt Power Company and distributed by them.

Cobalt Power Company

At Hound Chute, on the Montreal river, six miles below Gillies Depot and six miles south of Cobalt, the Cobalt Power Company completed, in May, 1910, a power plant for supplying electric power, chiefly to the mines at Cobalt. The effective head of water is 35 feet, and a dam 27 feet high at the head of the falls diverts the water into a new channel 1,400 feet in length leading to the power house at the bottom of the falls.



One of the four 1875 k.w., 3-phase, 2,400 volt generators with turbine and governor. Mines Power, Limited.

The power house is 132 feet long, 32 feet wide, and 82 feet high from the top of the walls to the bottom of the wheel pit, and is built of steel and concrete. The electric equipment consists of three 750-k.w. generators direct connected with three turbines of 1,465-h.p. each. There are two exciters, each direct connected to a turbine, one being held in reserve in case of accident.

The 3-phase current is stepped up to 10,000 volts for transmission, and will be stepped down to the voltage required by the consumer. The transmission line to Cobalt consists of two complete circuits on a single pole line.

The company supplies power either at a flat rate of approximately $50 per h.p. per annum, or on a meter basis.

Mines Power Limited

About June 1st, 1909, the Mines Power, Limited, began developing electric power on the Matabitchouan river, about two miles from the Montreal river landing, on lake Temiskaming, and 23½ miles southeast of Cobalt, and although the physical conditions as to transportation of apparatus and supplies were of a severe type, this company was enabled to complete the development and to make delivery of electric power in March, 1910.

At the point of development the Matabitchouan river makes a horseshoe sweep. The waters have been diverted, at one point of the horseshoe, through an intake canal and the penstocks to the power house, which is located at the other point of the horseshoe.

The main dam, which has been constructed at the curve of the horseshoe, is of solid concrete, with a length of 860 feet and a maximum height of 50 feet, which raises the water 40 feet above its former high level and gives a working head of 312 feet. Several lakes of various sizes have been utilized for storage purposes.

The power house, of solid concrete construction, has been designed for and is capable of developing 10,000-h.p. It is 57 feet by 105 feet, and is thoroughly equipped with travelling cranes and other appliances.

The two penstocks are 5 feet in diameter and 1,075 feet in length, each supplying water to a pair of turbines. The water is directed to the turbines by means of forged steel moveable guide vanes.

The turbines are of the horizontal reaction type, consisting of a single runner in spiral case, with a speed of 600-r.p.m., and rated at 2,750-b.h.p. each.

The electric equipment consists of four 1,875 k.w. A.E. generators direct connected to the turbines. Two exciters are installed, each being connected to a Nobel impulse wheel with a rating of 180-h.p., 475-r.p.m. Four 1,875-k.w., 3-phase transformers are used to increase the voltage to 44,000 volts. High-power governors have also been installed to insure perfect regulation.

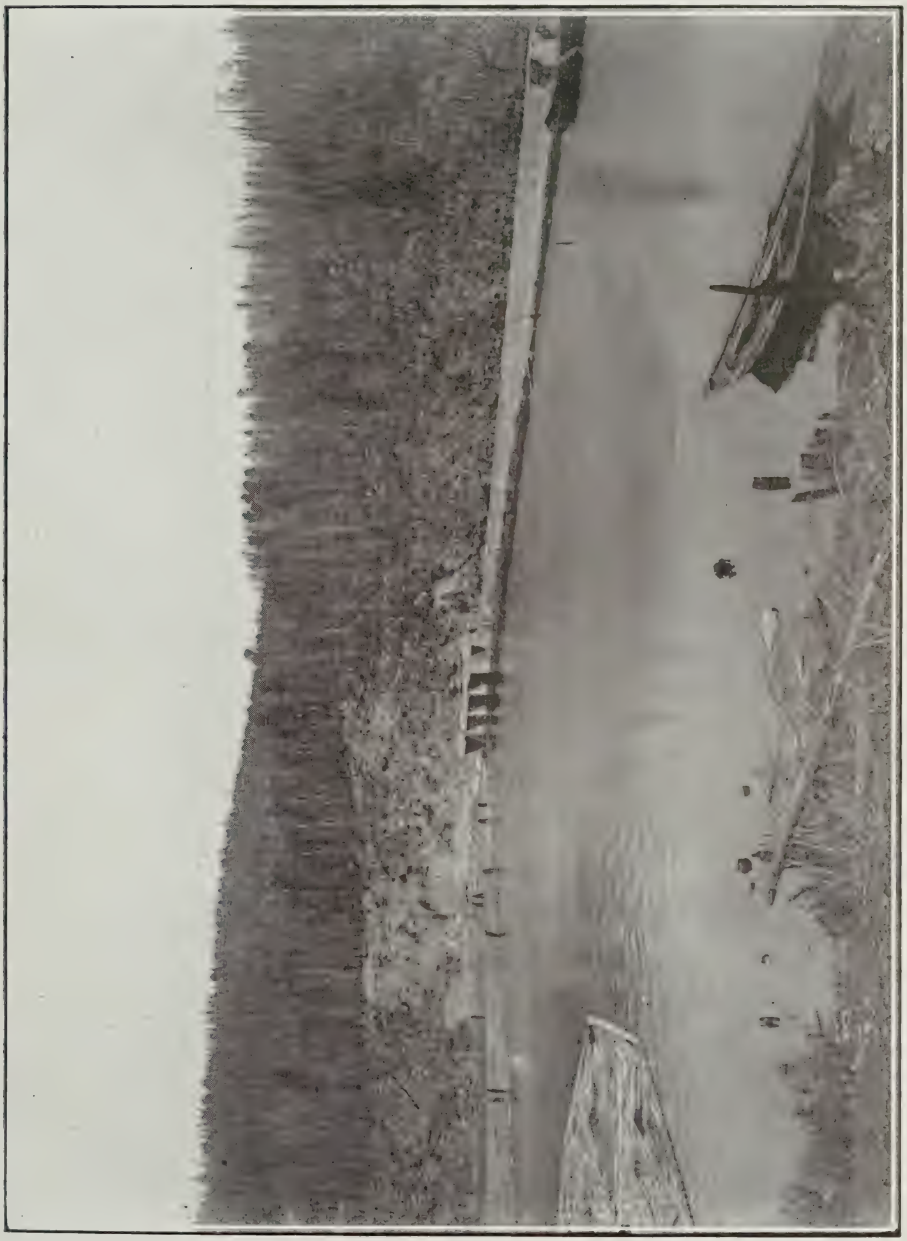
The two 25-mile transmission lines are both 3-phase, and are operated at 44,000 volts, each line having been erected on a separate set of poles 35 feet apart.

The overhead work is of substantial construction, and each line is of sufficient capacity to carry the entire load in the event of trouble developing.

Stranded aluminium cable has been used for conductors, and these are supported on high-tension porcelain insulators.

The 135-foot right-of-way has been cleared of all brush and trees, and all high trees on either side have been removed. Patrolmen are stationed at different points, and the entire line is inspected daily.

Two sub-stations have been erected to serve the Cobalt camp, one at Cobalt lake, with a capacity of 5,500-h.p., and one at Brady lake, with a capacity of 3,200-h.p. Each station is equipped with the necessary step-down transformers, lightning arresters, switching devices, etc., and in each there have been installed two 2-stage air compressors. Each compressor is capable of developing 5,000 cubic feet of free air per minute, and is driven by 1,000-h.p. 2,200-volt induction motors. The compressors are of special



Up-stream side of main concrete dam. Mines Power, Limited.

design, having been constructed under a guarantee requiring the delivery of air at mines at 100-lb. pressure and at approximately atmospheric temperature and free from moisture.

The sub-stations have been connected by both air lines and 2,200-volt electric lines, to guard against shut-downs due to sub-station troubles.

The electric distribution to the various properties is 3-phase, 60-cycle, 2,200-volt, thus obviating the necessity of maintaining high voltage sub-stations on customers' premises.

For the supply of current for small units and for lighting purposes, 550-volt and 110-volt line transformers are used.

The electric service is being used to operate the lines of the Nipissing Central railway. Alternating current is delivered in the form of 3-phase, 2,200 volt, and is converted to 550-volt direct current by means of motor generator sets in the railway's sub-stations.

The Cobalt Light, Power and Water Company are supplied with current for illuminating and other purposes in Cobalt.

The selling rates are as follows:—

Compressed air, 24 cents per 1,000 cubic feet, at 100-lb. pressure.

Electric service, approximately $50.00 per h.p. per annum for 24-hour service.

The high-tension transmission lines are erected through South Lorrain. To meet the market a substation of 1,500-h.p. capacity is being erected at Beaver lake, and one of 500-h.p. capacity at Latour lake.

The president of the company is Mr. E. A. Wallberg, of Montreal, and the general manager Mr. F. John Bell, of Cobalt.

In the Sudbury Nickel Field

Huronian Power Company

This is a subsidiary company of the Canadian Copper Company, formed for developing electric power for use at the mines and smelter of the Canadian Copper Company. The site is at High Falls on the Spanish river, in the township of Hyman, about four miles from the "Soo" line of the Canadian Pacific railway, at a point about 23 miles west of Copper Cliff station. It is connected with the railway by a spur line from Turbine station.

Work was begun on this spur line in the spring of 1904, and on the power development proper in the following September. Power was turned on at Copper Cliff in February, 1906. The power house is situated on the lower point of an island in the river, across which the water is carried. The natural head was 67 feet, which has been raised by the dams to 85 feet. The effective water-shed is upwards of 2,000 square miles, practically all improved, containing much lake surface.

The dams are all of concrete construction on solid rock. The work of construction was carried on continuously throughout the winter of 1904-05.

Log slides and booms had to be provided, to handle the very large cut of timber which is annually driven down the Spanish river.

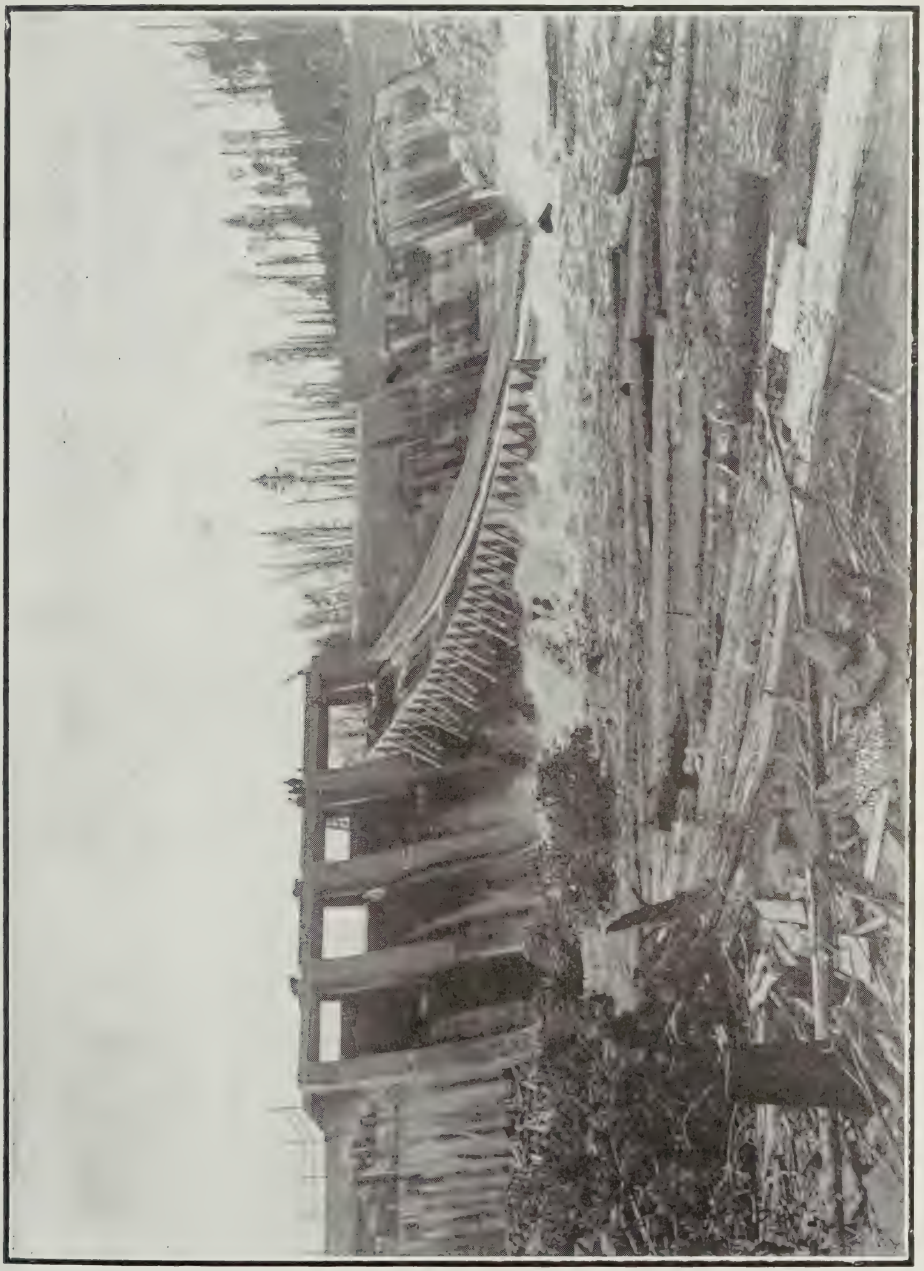
From the bulkhead wall three9-feet steel penstocks for generators, and one 3-feet for the exciters, are carried down the slope to the power house.

The power house is of brick on a concrete substructure, with steel roof trusses.

The roof covering is 2 x 4-inch lumber on edge, sheeted with galvanized iron. The building is 106 feet long by 71 feet wide, with an annex 33 x 30-feet at one end for workshop and heating boiler. The blower system of heating is used.

The generator room is 55 feet wide, leaving 16 feet along one side for transformer rooms and switch tower, which are separated from it by fireproof brick walls and steel doors.

There is space for four generating units, three of which are installed. Each unit consists of a 2,000-k.w. generator, 3-phase, 25-cycle, 2,400-volt, direct connected to the shaft of a 3,550-h.p. turbine, on which are mounted two 34-inch bronze runners in a single case.



Down-stream side of main concrete dam, showing log slide. Mines Power, Limited.

The head is 85 feet and the speed 375-r.p.m.

There are two exciters of 200-k.w. each, either of which can furnish excitation for four generators. Each exciter is driven by a small turbine, direct connected.

Three sets of transformers, of three each, step up the voltage from 2,400 to 35,000, at which it is transmitted.

The operators' bench board occupies a central elevated position in front of the switch tower, giving a full view of the generator room and the switching operations in the tower. All switches are distantly controlled, and there is nothing higher than 125 volts on the board.

A small motor-driven air compressor is installed for cleaning purposes and for handling oil by air pressure.

For fire protection there is a 500-gallon, 2-stage turbine pump, direct connected to a 50-horse-power d.c. motor, operated from the exciter. The pump suction is connected to the penstocks.

The penstocks, bulkhead gates and screens are housed, and the use of a small amount of current at critical points effectively prevents the building up of ice in the tubes.

The main transmission line is about 30 miles long, from the power house at High Falls to the substation at Copper Cliff, for the most part on its own right of way, 100 feet wide, all cleared. It is of double cedar pole construction, with poles at eight feet centres, bolted to a common cross-arm.

There are two independent 3-phase circuits of No. 1 wire, arranged in two equilateral triangles, 4 feet apart and 4 feet to a side. One circuit is transposed and the other straight. The pole stands are placed 120 feet apart.

Branch lines of single pole, single circuit construction, run from the main line to Crean Hill mine and Creighton mine, each being about 3½ miles in length. These are both connected to the same main circuit with aerial switches.

Lightning arresters, of the horn type, are provided outside of the power house and the sub-station at Copper Cliff, Creighton and Crean Hill.

A telephone line runs direct between the switchboards in the power house and smelter sub-station, along the transmission line. It is carried on a short cross-arm, 6 feet below the main cross-arm, with the wires transposed every fifth pole. It gives good service.

A second telephone line, carried for the most part on the poles of the Canadian Pacific railway's telegraph, connects the terminal stations with the Copper Cliff central station, and also with Crean Hill and other points between.

Lorne Power Company

The Lorne Power Company's plant is located at Wabageshik falls, Vermilion river, about 3½ miles from Nairn Station on the "Soo" branch of the Canadian Pacific railway, and 9 miles in a southwesterly direction from the Mond Nickel Company's smelter at Victoria Mines. This company is a subsidiary company of the Mond Nickel Company, and was formed for developing electric power and supplying it to that company for use at its mines and smelters.

The plant has been in operation one year and has given good service.

The main dam, forebay and power house were built of concrete on rock, and are of heavy design and permanent construction.

One unit was installed at first, but provision was made for a second unit, which is now being installed.

The penstocks are 450 feet in length and 8 feet in diameter. They are provided with two expansion joints each and are supported on concrete piers. Steel head gates are provided, and stop-log checks have been constructed in the forebay with a 12-inch drain pipe to provide for examination of the head gates if this becomes necessary.

Each unit consists of a horizontal twin turbine 2,200-h.p., 300 r.p.m. built to operate under 50 feet head; direct coupled alternator, 1,500-k.w. (or 1,200-k.w. at

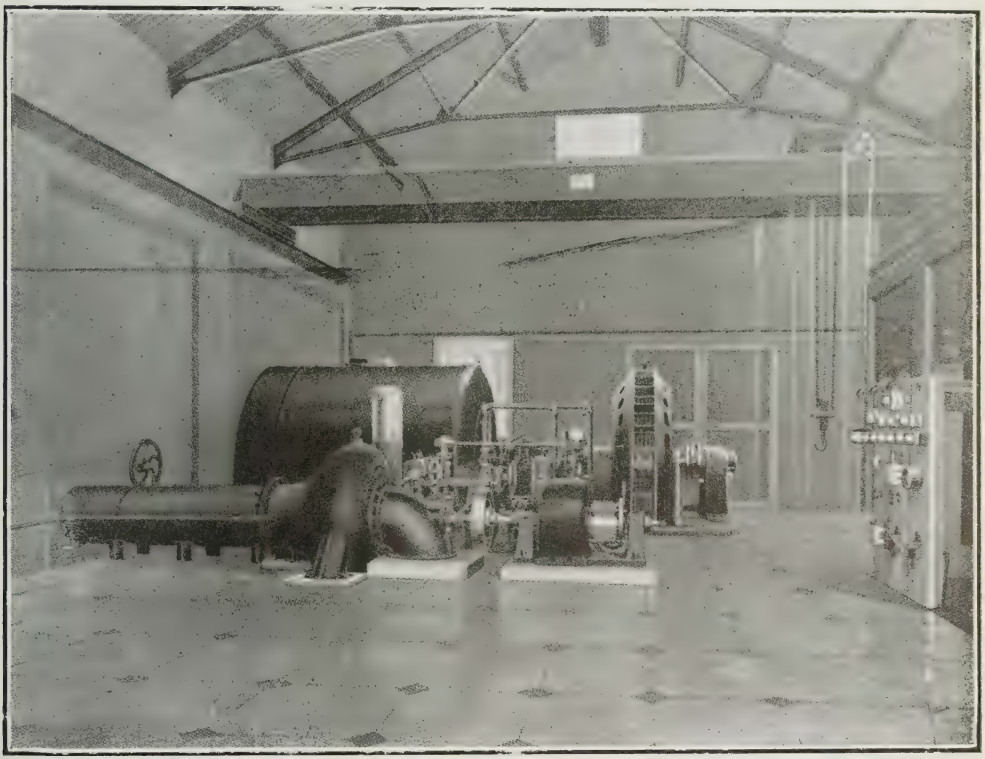


General view of power plant at High Falls, on Spanish river. Huronian Power Company.



General view of main dam, forebay, penstock (partly covered) and power house, Wabageshik.

80 per cent. power factor) 60-cycle; exciter turbine 110-h.p., 875 r.p.m.; exciter generator, 60-k.w. 120 volts; Allis-Chalmers Company oil governor for both main and exciter turbines. The exciter turbine penstocks are branched from the main penstocks, and are being coupled together in such a manner that either exciter turbine may be operated from either main penstock. Similarly either exciter may be used with either alternator. The 3-phase current is stepped up from 2,200 volts through three 800-k.w. transformers and delivered to the lines at 16,500 volts. The plant is provided with a 10-ton crane and the usual switchboards and other apparatus. It is protected by two sets of lightning arresters, and has so far not been interfered with by electric storm.



Interior view Lorne Power Company's plant, Wabageshik.

Sudbury Power Company

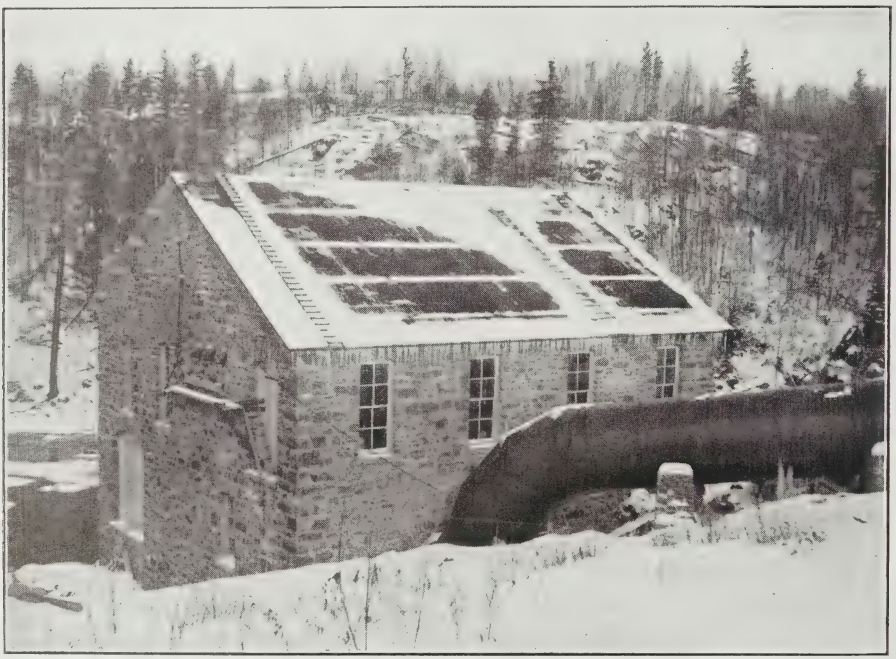
At McPherson's falls on the Vermilion river, on lot 11, concessions 1 and 2, Creighton township, about 16 miles west of Sudbury, the Sudbury Power Company have developed a water power. The natural head of the water power at the falls is 17 feet and the artificial head 24 feet. The power house is built of stone, and the dam of timber filled in with stone. A 1,000-k.w. generator manufactured by the Allis-Chalmers-Bullock company has been installed. The voltage is raised by transformer to 22,000 volts before being transmitted. The generator is coupled direct to four horizontal water wheels of the Samson Leffel pattern. There are also two 75 k.w. exciters, each driven by a separate pair of wheels and each pair of wheels is coupled direct in its own flume. The tail races are 12 by 20 feet in section, and are cut out of the solid rock.

Wahnapitae Power Company

On the Wahnapitae river, about nine miles southeast of Sudbury, the Wahnapitae Power Company completed the development of a water power in 1905. The power plant is situated about 18 miles from the lake of the same name, which has an area of 120 square miles.

The dam above the power house is built of timbers bolted to the rock and to each other, with interstices between the timber filled in with rock. It has a height of 35 feet, and a width of 200 to 250 feet.

The forebay, which is south of the dam, is 300 feet in length and its walls are of stone and cement. The dam at the end of the forebay is 25 feet in height, 15 feet thick at the bottom and about 6 feet at the top. The penstock from the forebay to the power house is 10 feet in diameter and 163 feet long. Three additional openings are left in the dam for increasing the capacity of the plant, which would then have a total capacity of 5,000 to 6,000 horse power.



Power House, Wahnapitae Power Company.

The total height of the fall is 56 feet. The tail race is 20 to 25 feet deep and 22 feet wide, cut out of solid rock. The turbine, manufactured by the Jenckes Machine Company, of 1,600-h.p. capacity, is direct connected with an alternating current, 60-cycle generator, which develops 800-k.w., or about 1,200-h.p. The two transformers raise the voltage from 2,300 to 23,500 volts for transmission over the line. Power is at present being transmitted to Sudbury, a distance of 9 miles, by triple-phase transmission wire (No. 4). A transformer at Sudbury reduces the voltage to 110 or thereabouts for lighting purposes. Another unit was installed in 1909.

The company are also supplying the Garson mine with 800 horse power, and a transmission line is being erected to the Moose Mountain iron mine, which will use electric power when the installation is completed.

In Eastern Ontario

Black Donald Graphite Company

A small power was developed at Mountain Chute on the Madawaska river in 1901 for use at the Black Donald graphite mine, about two miles distant. The full power if developed would have an estimated low water flow of 790 c.f.s. under a 40-foot head and a minimum 24-hour power of 2,860-h.p. The company in installing the plant made use of a lumber company's dam and log chute, the flume being built in the rocky side of the river 90 feet in length by 20 feet wide and 12 feet high. The outside cribbing extends into the middle of the chute, with a penstock at the end, giving 22 feet head of water. The flume and penstock were rebuilt in 1908, the old wooden flume having been carried away by the high water. The new flume was cut in the solid rock at the side of the falls. The power house contains four 30-inch water wheels of a total capacity of 600-h.p. on one horizontal shaft direct connected to a 350-k.w. generator. The 3-phase alternating current is transmitted over a line two miles in length to the mine, where it is used to drive all the machinery.

The Seymour Power and Electric Company

The power station of the Seymour Power and Electric Company is located near the Government dam No. 1, section 5, on the Trent Valley canal, one mile above Campbellford, where an operating head of 23 feet is available. The power plant, when all the machinery is installed, will have a rated capacity of 3,000 k.w. Two machines are at present installed, having a capacity of 1,500 k.w.

The average discharge of the river is estimated at 4,742 cubic feet per second.

Dam No. 1, section 5, of the Trent Valley canal was built across the river by the Dominion Government. The locks are on one side of the river, and on the other side the Power Company have built the headworks for the intake canal, which conveys the water to the generating station, about 1,200 feet below, and near the shore line.

The substructure of the generating station is composed of concrete and the superstructure of concrete blocks. The equipment consists of two 750-k.w., 3-phase, 60-cycle, 2,400-volt., 150-r.p.m., vertical type generators manufactured by the Canadian General Electric Company. When completed, it will consist of five 750-k.w. generating units.

The generators are direct connected to vertical turbines of the double-runner central discharge type, having a maximum capacity of 1,100-h.p., under 23 feet, at 150 r.p.m. The revolving parts of the two units are supported by an oil lubricated thrust bearing of the cast-iron disc, spherical seat type, on a concrete and steel thrust deck erected between the generator and the turbine. The generating units are located in line on the upstream side of the building, the transformers in pockets on the downstream side and the main switchboard between the generators and the transformers. The transformers have a normal capacity of 1,125 k.w., and will operate 2,400 volts to 44,000 volts.

The switchboard consists of 15 slate panels. Each generator panel is equipped with an A.C. ammeter, an indicating wattmeter, a power factor meter, a D.C. field ammeter, a double throw field switch, a hand wheel for operating field rheostats, a switch lever for operating the generator oil switch, voltmeter and synchronizer plug receptacles.

At present there are two compound wound exciters rated C.Q. 15-17½-1,200, 115-125 volts. The exciters are belt connected to the generators.

The power lines entering the power house are equipped with lightning arresters of aluminium cell type.

The generating room, 26½ feet wide by 107 feet 4 inches long, is spanned with a 15-ton electric travelling crane.

The transmission wires are supported on wooden poles spaced 132 feet apart.

The conductors are of stranded hand-drawn aluminium. The aluminium used is manufactured at Shawinigan Falls, Quebec. The specification called for a conductivity

of at least 61 per cent. according to Matthiessen's standard, or ultimate strength of at least 25,000 lbs. per square inch, an elastic limit of not less than 14,000 lbs. per square inch and a modulus of elasticity of 9,000,000.

One sub-station is situated at Deloro, 22 miles from the power house. This consists of three 250-k.w. single-phase, oil insulated, self-cooled Westinghouse transformers, delta connected. The primaries are wound for 44,000 volts and the secondaries for 600 volts.

Another sub-station is located at Madoc to supply the town and the talc mill.

Belleville sub-station supplies the Trenton Electric and Water Company with power and light for Belleville.

Sub-stations have also been erected at Sulphide, where 300-400 h.p. is supplied, and at the town of Sterling, which is equipped with a 100-k.w. transformer for supplying light to the town. The Northumberland Pulp Company at Campbellford will take 800 h.p.

The engineers who have charge of the construction work are the firm of Smith, Kerry and Chase, of Toronto, to whom I am indebted for the details of this description.

THE KENT GAS FIELD

By G R Mickle, Mine Assessor.

The most interesting and important event in connection with the development of the natural gas industry in Ontario in recent years is the discovery and delimitation of this field, covering portions of the townships of Romney, East Tilbury and Raleigh. The accompanying sketch shows the field forming roughly a triangle with the base resting on the lake.

Where and How the Gas is Found

Drilling operations commenced in what is marked as "Oil Territory" on the plan in the year 1905, and the operations were pushed southwards. In December, 1906, the first well was drilled in the area near the lake, which has since proved to be productive of the wells of greatest capacity. Operations continued throughout 1907 and 1908, and by May of 1909 the limits of the field could be determined with some exactness so far as the land area is concerned. The gas-bearing rock, without doubt, however, extends some distance under the lake, and the wells of largest capacity are found not far from the lake shore.

The gas exists in the Onondaga formation (Jour. Can. Min. Inst., Vol. X., p. 82) in a dolomite rock. Usually four pay streaks are present. Thus, in three wells, which may be taken as typical of the southern or most productive part of the field, the levels at which "gas pay" was found were as follows:—

(1) First gas found at	1,120	ft. depth.
Second " " "	1,210	"
Third " " "	1,305	"
Fourth " " "	1,345	"
(2) First gas found at	1,145	"
Second " " "	1,240	"
Third " " "	1,355	"
Fourth " " "	1,380	"
(3) First gas found at	1,145	"
Second " " "	1,305	"
Third " " "	1,375	"
Bottom of hole	1,380	"

The Probable Supply of Gas

The capacity of the wells in this field is much greater than is usual in Ontario. Thus the "open flow" measurement of the wells in the Haldimand field, near Selkirk, which has not been drawn upon for long and is therefore near its maximum, averages less than 200,000 cubic feet in 24 hours. Only about 4 per cent. of the wells show a measurement of 500,000 feet or over. In the Kent field, on the other hand, a number of wells have an open flow capacity up to 7,000,000 feet, and the average of 17 wells known to the writer is about two and a half million feet.

At the present time the gas is piped to the following towns or cities, besides supplying farm houses along the lines, viz.: Chatham, about 14 miles; Windsor, about 45 miles; Sarnia, 55 miles; Blenheim, 14 miles; Ridgetown, 23 miles; Tilbury, Merlin and several other smaller places on the way to Windsor and Sarnia. In all, something like a population of 50,000 people is served by natural gas from this field.

The Factors of Supply

The question naturally arises, How much gas will be produced here? The quantity of gas depends on four factors, viz.:

(1) The area over which the gas-bearing rock is found.

(2) The average aggregate thickness of gas-bearing rock.

(3) The rock pressure.

(4) The amount of pore space in the rock.

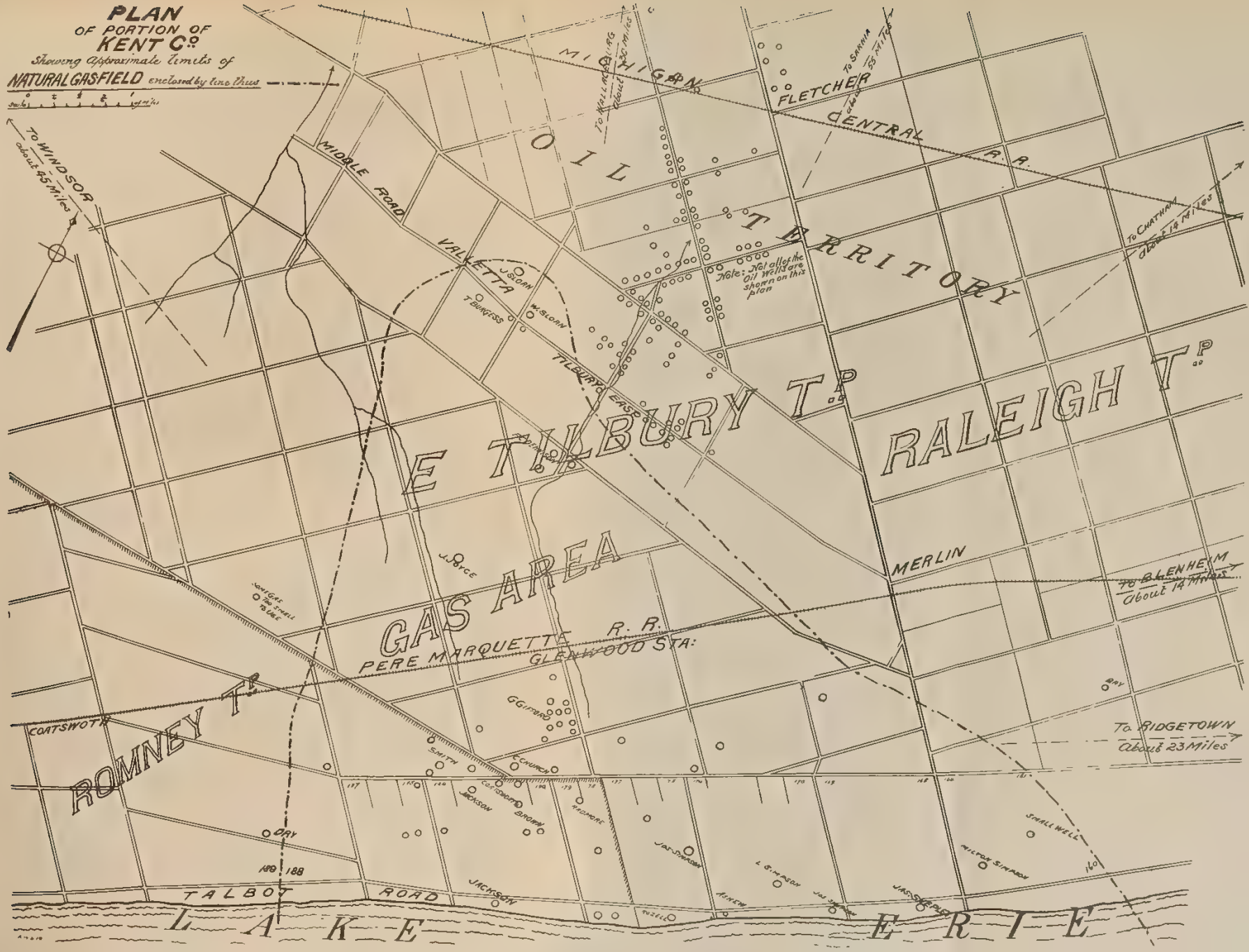
With regard to the area, as the field is fairly well delimited, and practically no dry holes are found, this can be calculated. In measuring this, as all the evidence points to the gas-bearing rock extending some distance under the lake, a line was drawn parallel to the shore line one mile out in the lake and this was included in the gas area shown on plan. A planimeter was then used to measure the area. It proved to be 34.6 square miles. The chances are greatly in favor of the field extending further than this under the lake, and later on when the pressure drops, as the supply of gas diminishes, this gas will find its way in, as it is inconceivable that there could be a pressure of say 50 lb. or less on the land area, and 600 lb. in the same strata of rock under the lake. The figure arrived at below, therefore, is probably too small. It cannot be too large.

The second factor, the average thickness of gas-bearing rock, can be approximated by observations taken in drilling, and noting by measurements of the flow of gas from time to time how much this increases as the hole advances. Thus a layer of gas-bearing rock will be struck and the flow measured every foot, say, till the measurement is constant. There will then be no further increase of the flow till another pay streak is struck. The aggregate thickness of these layers has been taken as 10 feet, which is a safe estimate given by drillers.

The third factor, the rock pressure, is measured direct by a pressure gauge. The conventional way is to open the well if closed before, or close it if open, for five minutes, and take the reading at the end of five minutes. It is evident that this is a severe test when applied, as it will be later on, to a calculation of the amount of gas which has flowed from the field between certain periods of time. The rock pressure is about 600 lb. per square inch (a trifle less as a rule), or about 40 atmospheres. As a cubic foot of gas means a cubic foot at normal atmospheric pressure, and the volume occupied by gas varies inversely as the pressure—i.e., double the pressure expressed in atmospheres and the volume is decreased one-half—it is plain that when the pressure on the gas is reduced, as it always is before using, to about the normal atmospheric rate, the gas will occupy forty times the space it did in the rock. So that the insignificant pore spaces in the rock, very often so small that they cannot be seen by the naked eye, are capable of storing a large amount of gas.

The amount of pore space in the rock is the only factor in the calculation which cannot be measured directly or approximated in any way. From observations in other fields, however, it is calculated that the pore space runs generally from 4 to 16 per cent. of the total volume of the rock. Taking 10 per cent. as the mean, with the area, thickness and rock pressure mentioned above, we arrive at about 38,000 million cubic feet as the total probable output of the field.

This calculation admittedly depends on one thing which cannot be measured directly, but an independent check can be applied by an observation of the difference in rock pressure at two periods of times sufficiently far apart, and noting at the same time the amount of gas which has been produced. Thus from January, 1908, to May, 1909, inclusive, the total amount of gas produced from this field, including the waste, was about 1,810 million feet; this is 4.8 per cent. of the total supply calculated above, whereas the actual drop in the rock pressure, which is a definite accurate measure of the loss of volume, is only about 3.0 per cent. It is not possible with any other mineral product to make a calculation of this nature. We must, then, conclude that either the area or the pore space or the thickness has been assumed as too small. Applying this correction gives about 61,000 million feet as the probable output. This, as emphasized before, cannot be too large and probably is too small, as any extension of the gas-bearing rock under the lake could not show its effect on the pressure till a considerable reduction of the gas supply, and consequently in the pressure, takes place. The amount given, about 61,000 million feet, is the *minimum* possible supply. The length of gas-bearing rock measured along the lake shore is 8 miles; an extension of


PLAN
OF PORTION OF
KENT Co.
Showing Approximate limits of
NATURAL GAS FIELD enclosed by line thus
To WINDSOR
about 45 Miles
MIDDLE ROAD
VALETTA
J. SLOAN
T. BURGESS
W. SLOAN
TILBURY EAST
ADJALA
To MILLGROVE
about 30 Miles
MICHIGAN CENTRAL R.R.
To SARNIA
about 55 Miles
FLETCHER
OIL TERRITORY
Note: Not all of the Oil Wells are shown on this plan
To CHATHAM
about 19 Miles
TILBURY T.P
RALEIGH T.P
GAS AREA
J. BOYCE
MERLIN
To BLENHEIM
about 14 Miles
PERE MARQUETTE R.R.
GLENWOOD STA:
ROMNEY T.P
COATSWORTH
G. GIFFORD
SMITH
E. CHURCH
JACKSON
CASTLECROFT
BROWN
FISHER
DAY
188
189
TALBOT ROAD
JACKSON
TISELL
JAS. SIMPSON
L. SIMPSON
JAS. SIMPSON
JAS. SHEPLER
MILTON SIMPSON
SMALL WELL
To RIDGETOWN
about 23 Miles
LAKE ERIE

that two miles more out into the lake—and there is no reason why it should not go ten miles—would increase the area by about 16 square miles, or about 50 per cent., and would probably increase the gas supply by the same amount. For the *probable* amount 70,000 million feet would doubtless be nearer an intelligent estimate than 61,000 million.

How Long will the Supply Last?

The interesting question of how long this supply of gas will last is more difficult to determine, as it depends on the uncertain action of individuals animated by a variety of purposes, and not on any of the laws of nature. It will depend mainly on how well the gas is conserved; this in its turn is governed by legislation, and the manner in which the law is enforced. The greatest danger threatening the natural gas supply is the action of those drilling for oil. As mentioned in explanation of the operations of the Supplementary Revenue Act in 1909 elsewhere in this Report, the gas area and the oil territory in the county of Kent are closely connected. The oil if obtained can be sold at once, whereas to sell the gas, long expensive pipe lines must be laid, franchises obtained from towns and cities and then so much gas only can be sold each year. Moreover, the great expense of pipe line, increasing as the distance to which it is to be transported increases, prohibits taking the gas far to market. The individual interested in oil will, unless restrained, undoubtedly in the future as in the past sacrifice gas recklessly to secure a trifling amount of oil.

The use of natural gas for certain industrial purposes, e.g., as a substitute for coal under ordinary boilers to make steam, will tend of course to shorten the life of the field. Assuming that it was used only for domestic purposes, i.e., cooking, heating and lighting, the supply ought to last the 50,000 people who are now connected with the field thirty-three years at least, with a strong probability that it will exceed that period of time considerably.

The above calculation allows one million cubic feet per day throughout the year for each 10,000 of population. This is a liberal allowance. The city of Toronto, using artificial gas in many houses for cooking and heating and also for lighting, and to some extent for industrial purposes, with a population of 350,000, say, consumes about seven million feet per day all the year round, or 200,000 feet per day for each 10,000 inhabitants. This artificial gas is not equal to natural gas in heating efficiency, which varies according to the mode of manufacture; the kind supplied in Toronto is equivalent to only about two-thirds the same amount of natural gas. Thus, the efficiency of Toronto gas is 651.8 British thermal units per cubic foot (Dr. Ellis' report on System of Lighting for Toronto, 1900), whereas the natural gas has an efficiency of about 1,000 B.T.U. (Poole, Calorific Power of Fuels). The town of Galt, with about 10,000 people and approximately 1,800 meters in use, the gas being consumed for cooking, lighting, and to some extent for heating, consumes about 280,000 feet per day (statement from Dominion Natural Gas Company). The best example is probably Chatham, which takes its supply of gas from this field. The average consumption per day for domestic purposes, as shown by the 2,000 meters installed, is 700,000 cubic feet (Volcanic Oil and Gas Company). The population is about 10,000 and gas is used freely. On this purely domestic basis of consumption, 30 per cent., or ten years, more should be added to the life of the field.

In 1894 a select committee of the Legislature was appointed to enquire into the production of natural gas in Ontario. After investigating the matter thoroughly this committee stated in its report:—

"That as regards the economic uses of natural gas, witnesses are agreed that it is one of the most valuable of all fuels, and in view of the limited supply it appears desirable that its use as far as possible should be confined to the purposes of domestic fuel and in the production of the finer classes of manufacture."—(Journal Legislative Assembly, Vol. XXVII., 1894, Appendix No. 1, p. 6.)

Nothing has happened since to modify the conclusion arrived at then; in fact, the continued depletion of all fuel supplies emphasizes the soundness of this judgment.

In calculating the life of the field, therefore, it seemed desirable to give it under the best possible conditions. The actual life will depend on how nearly these conditions are fulfilled.

Relative Value of Oil and Gas

As the units used in speaking of gas and oil are quite different, it seems desirable to reduce both to some common basis so that a comparison may be made between the two. Natural gas is employed mainly as a source of heat, the amount used directly for light being relatively insignificant. Oil, on the other hand, is chiefly known as an illuminant. Gas and oil will be compared both as heat producers and illuminants. The most rational method is to find the heating efficiency of each. When the two products are used for lighting under the most economical conditions, that is with a mantle, the light given is proportional to the heating power. What occurs is that the mantle is heated to a high temperature and radiates the light; where the naked flame is used the particles of carbon become heated and act as radiators.

Poole, "Calorific Power of Fuels," p. 251, gives the following data concerning various oils:—

Bothwell oil	173,400	British thermal units per gal.
Ohio, refined	164,736	" " " "
Ohio, crude	172,800	" " " "
Canadian Oil, refined (Dr. Ellis' report quoted above)	154,585	" " " "

Natural gas averages about 1,000 B.T.U. per cub. foot; thus Poole, p. 254, gives 1,050 as the mean for Ohio gas, which is most closely allied with the gas in Kent. No determinations of the Kent gas for heating efficiency have been made, as far as the writer is aware. With 1,000 cub. feet as the unit for gas, this would give of course 1,050,000 B.T.U., and assuming the average efficiency of the oils given it will be seen that about 6.5 gal. of oil are equivalent to 1,000 cub. ft. of natural gas. A barrel of oil (35 gal.) is therefore equal to about 5,400 cub. ft. of natural gas in heating power and consequently in illumination.

Coming to the question of the quantity of oil that will be produced, no such calculation of the amount in a given field can be made as was done with gas. The rock pressure as an indicator fails here. The oil being a fluid cannot be compressed like the gas. Moreover it is much more viscous than the gas, and consequently cannot find its way as readily through the rock. All we have to rely on is the actual results in production from wells drilled; where these are sufficient in number (several hundred in this case) and show the same general results, the evidence is strong enough to form a conclusion. As far as the strata already tested are concerned (*i.e.*, to about 1,430 feet in depth) the information seems sufficient. Thus the production from the oil territory in question in East Tilbury, Romney and Raleigh is given in the Eighteenth Report of the Bureau of Mines, p. 33, as follows:—

1906 (first production in this year)	106,992 barrels.
1907	411,588 "
1908	201,283 "
1909 (See present volume)	124,003 "
Total	843,866 barrels.

It will be noticed that there has been a very rapid falling off in the oil production —about 50 per cent. in each year. For 1910 the amount will probably not exceed 50,000 to 60,000 barrels. The yield of well after well has declined in a way that must be painfully monotonous to the operators. The total production of oil, therefore, up to the end of 1909 is equivalent, on the basis explained above, to 4,556 million cubic feet

of gas. As the minimum gas supply in the Kent field was calculated to be 61,000 million feet, the oil production to the end of 1909 is equivalent to only about one-thirteenth the estimated gas production. The probable yield of 50,000 barrels of oil for 1910, or 1,750,000 gal., is equal to 270 million feet of gas, or less than the average production of gas for one week from that field during 1910. There may, of course, be oil in lower strata, but that is only a possibility.

Looking at the matter in another way, 6.5 gal. of oil are equal to 1,000 cub. feet of gas in efficiency, or 6,500 gal. of oil equal one million feet of gas. At the rate of 5 million feet per day, assumed above in calculating the life of the gas field, this is equivalent to 32,500 gal. of oil per day, or somewhat less than 1,000 barrels per day, more exactly 339,000 barrels per year, and as was shown above, this can continue for thirty-three years at least.

Comparing the cost to the consumer of illumination derived from oil and gas respectively, it will be seen that he would have to buy refined oil for the same price as is paid the producer for crude oil delivered at the railroad, in order to have an equal amount of light for the same cost as from gas bought at the current rates in that locality. Thus $1.24 per barrel or 3.5 cents per gal. is paid for crude oil; multiplying this by 6.5 the number of gal. equal to 1,000 ft. of gas, gives about 23 cents as against 25 cents per 1,000 feet ordinarily paid for natural gas from that field. Crude oil is of course not all burning oil. In this locality it consists of about 40 per cent. kerosene or illuminating oil, the balance being lighter products such as benzine, etc., and the lubricating oils.

The relation between illuminating power and oil consumption in everyday practice is very difficult to arrive at exactly by direct test. The art of using the oil to the very best advantage is not ordinarily as far advanced as it is in the case of gas. The illumination depends mainly on the quantity of oil burned in a given time. Other circumstances have influence, however, as Argand burners, for instance, give more light from an equal amount of oil than flat wick burners. "The character of the wick, the dimensions of the chimney and the size and shape of the oil reservoirs are factors of only slightly less importance than the form of the burner." (Boverton Redwood, Petroleum and Its Products, Vol. II., p. 674.) Redwood states that the average consumption of oil per candle light per hour, using duplex Argand burners, is 50 grains, equivalent to 1,120 candle-hours per gallon of oil. With ordinary burners the oil consumption would be much greater. Artificial gas burnt without a mantle gives about 2,800 candle-hours per 1,000 cub. ft. No one would nowadays think of burning natural gas without a mantle. With the use of this about 2½ cubic feet per hour of natural gas give 25-candle lights or 1 cub. ft. gives 10 candle-hours, and 1,000 cub. ft. give 10,000. Therefore 1,000 cubic feet of natural gas are equivalent to slightly less than 9 gallons of oil in illuminating power under ordinary circumstances. Of course as the conditions under which oil is burnt are perfected, the relations will approach those explained before, where 1,000 cubic feet of gas were found to be equal to 6.5 gal. of oil.

CONCENTRATION OF LOW GRADE MAGNETITES

By George C Mackenzie

During the winter of 1907-1908 the writer made some preliminary tests with low grade magnetites, in connection with a report on "The Iron and Steel Industry of Ontario," published in the Seventeenth Report, Ontario Bureau of Mines. A few notes were compiled on the general problem of magnetic separation as applied to iron ores, and descriptions were added of three large magnetic separating mills operating in the United States. It will be unnecessary, therefore, to make any detailed description as regards the modern process, beyond a few remarks on the construction and operation of the separating machines that were used in making the tests now under consideration.

Ontario Rich in Low Grade Magnetite

Ontario, as far as we know at present, is comparatively poor in deposits of merchantable iron ore, and conversely may be said to be rich in deposits of low grade material. This fact is well known to everyone familiar with the situation, and is in part responsible for the heavy consumption of imported United States ores, as compared with the meagre tonnage of native ores smelted each year in Ontario furnaces. The question naturally arises: Are our numerous deposits of low grade magnetites to be considered of no value in the crude state, at the present market price of the rich United States ores? The Ontario furnaceman will affirm that such is the case, because he must pay a maximum figure for his fuel, and naturally is desirous of smelting only those ores that yield an amount of merchantable pig iron sufficient to insure the operation of his furnace upon a profitable basis. If he could secure cheaper fuel, he could afford to smelt leaner ores, but so long as he must pay between five and six dollars a ton for his coke, furnace economy requires an ore mixture yielding a maximum percentage of iron.

The Problem of Economical Concentration

By far the larger number of our low grade deposits consists of impure magnetites, which naturally leads one to suggest the process of magnetic separation, and subsequent marketing of the concentrated product. At first glance the solution of this problem appears to be easy. The crude ore is crushed to free particles of gangue rock from particles of magnetite, and is then passed through magnetic separators, saving the valuable iron and allowing the gangue to go to waste. Unfortunately the desired result is not so easily accomplished from the standpoint of commercial utility. When it is considered that the concentrated ore must compete with natural ores that are marketed at three to five dollars a ton, it is evident that the low grade material must be mined very cheaply, and then crushed and concentrated without excessive cost. Cheap mining is not possible unless operations are conducted on a sufficiently large scale, which, in turn, means that the deposits must be of such magnitude that readily admit of economical working. Then again, the concentrated product may be in a state of fine subdivision (depending upon the extent of crushing necessary to produce the desired concentrate) and therefore unfit for direct use in the blast furnace, necessitating either briquetting or nodulizing—an additional item of cost. Hence the problem is complex, and requires careful consideration of all factors likely to influence the financial success of the undertaking.

On the other hand, there are several important features connected with properly prepared concentrated ores, which give them distinct value over and above that of natural ores. The first and most important is the high iron content; secondly, the absolute standardization of the concentrated ore, which means that the iron and gangue contents will vary but slightly from day to day, affording the furnaceman an oppor-

tunity of carrying the maximum burden allowed by the fuel, with the elimination of any variable condition that is necessarily present when using natural ores. And thirdly, a greatly reduced loss due to flue dust, a very troublesome matter in every furnace using natural ores.

All of the foregoing items have, both singly and collectively, a direct influence on the fuel consumption per ton of iron made, and as Ontario furnacemen must use costly fuel, it would appear that a careful study of the situation is desirable before condemnation is made of the more costly concentrated ores.

The most accurate method of determining the value of any iron ore is naturally on actual trial by smelting the ore, under normal conditions, in a blast furnace. This is, of course, out of the question in the present instance, for obvious reasons, and therefore the only alternative for making comparison is on arithmetical calculation, based on well known factors, determined within reasonable accuracy by modern furnace practice.

Relative Value of Ores at the Furnace

It is presumed that the furnaceman has the opportunity of purchasing one of two different ores. He will naturally be desirous of buying the ore which will yield him the largest return for his money, and in all probability will, before he decides upon purchase, calculate the value of each ore to him, laid down at his furnace, under the conditions in which he is forced to operate. One ore may cost more per ton f.o.b. furnace than the other, but the higher-priced ore may contain more iron and less slag-forming materials, and therefore be more economical of fuel, yielding pig iron at a relatively lower cost per ton. The two ores in question may be assumed as follows:—

(A.) A typical Lake Superior, United States, ore, with the following analysis:—

Iron.	Silica.	Alumina.	Lime.	Magnesia.	Phosphorus.	Sulphur.
p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
54.00	9.32	1.37	0.17	0.22	0.041	0.006

(B.) Briquettes made from Temagami concentrates, analysing as follows:—

Iron.	Silica.	Alumina.	Lime.	Magnesia.	Phosphorus.	Sulphur.
p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
63.60	8.5	Trace	0.00	0.00	0.007	Trace

It is desired to ascertain the relative value of the above two ores to the furnace under the following assumed conditions[1]:—

Coke costs $5.25 per net ton delivered.

Limestone costs $0.75 per gross ton delivered.

Fixed charges are $2.25 per gross ton of pig iron.

Cost of producing one ton gross of pig iron not to exceed $16.00.

Bessemer iron to be made, containing approximately 1 per cent. of silicon and 95 per cent. of iron.

Temperature of hot blast to be 1000-1200 degrees F.

It is also assumed that for the reduction, impregnation and melting of the pig iron 66 per cent. of carbon will be required, and for the formation and melting of the slag about 25 per cent. of carbon will be required.

The slag is assumed to conform approximately in composition to the ratio

$$\frac{\text{RO Bases}}{\text{Silica} + \text{Alumina}} = \frac{52}{48} = 1.083 \text{ (Slag Ratio)}$$

The analysis of the coke is as follows:—

Fix. Carbon.	Silica.	Alumina.	Lime.	Magnesia.	Phos.	Sulphur.	Ash.
p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c	p.c.
85.00	6.16	2.57	0.40	0.26	0.13	1.26	10.5

[1] For this and similar calculations see "The Blast Furnace and the Manufacture of Pig Iron," by Robert Forsyth, pages 47 and 168.

The analysis of the limestone is as follows:

Silica.	Alumina.	Lime.	Magnesia.
p.c.	p.c.	p.c.	p.c.
3.96	0.32	39.25	10.85

The available base in this limestone is calculated as follows:

Acids.		Bases.	
Silica	3.96	Lime	39.25
Alumina	0.32	Magnesia	10.85
	4.28		50.10

4.28×1.083 (Slag ratio) = 4.64 bases needed to flux acids,
Hence 50.10—4.64 = 45.46 available base
And $\frac{100}{45.46}$ = 2.2 Efficiency of stone.

The slag-forming constituents of the stone are silica + alumina + lime + magnesia = 54.38 per cent. of the stone.

The available carbon in the coke is calculated as follows:

Acids.		Bases.	
Silica	6.16	Lime	0.40
Alumina	2.57	Magnesia	0.26
	8.73		0.66

8.73×1.083 (Slag ratio) = 9.45 bases needed to flux acids,
Subtract..... 0.66 bases present

Leaves ..... 8.79 bases to be added.

Then 8.79×2.2 (efficiency of stone) = 19.34 pounds of stone required to flux ash in 100 lb of fuel.

And $1.26 \times \frac{56}{32} \times 2.2$ = 4.85 pounds of stone required to flux sulphur in 100 lb. of fuel.

Total stone required..... 24.19 pounds per 100 lb. of fuel.

The slag formed by the fuel ash and sulphur equals the ash and sulphur plus the flux needed, thus:

8.73 + 0.66 + 1.26 + (24.19 × .5438) = 23.80 pounds weight of slag formed per 100 pounds of fuel;

And as the slag requires 25 per cent. of carbon for its formation and melting,

$23.80 \times 0.25 = 5.95$ pounds of carbon are required to melt slag from 100 pounds of of fuel.

Fixed carbon in coke	85.00
Carbon needed for slag	5.95
	79.05 available carbon in coke.

We are now prepared to calculate the relative value of the two ores under consideration.

The Lake Superior Ore

Consider first the Lake Superior ore. The amount of flux needed and slag formed is found as follows:

Acids.		Bases.	
Silica	9.32	Lime	0.17
Alumina	1.37	Magnesia	0.22
	10.69		0.39
Less	1.21		

reduced to silicon in the pig iron.

9.48 acids to be fluxed.

$9.48 \times 1.083 = 10.26$ bases needed,
Less.. 0.39 bases present,

9.87 bases to be added.

$9.87 \times 2.2 = 21.714$ pounds of stone required per 100 pounds of ore. And as $\frac{95.00}{54.00} = 1.759$ tons of ore are required to make one ton of pig, therefore $1.759 \times 0.21714 = 0.38194$ tons of stone required per ton pig. The slag formed by the ore per ton pig equals the slag-forming constituents of the ore, added to those of the stone needed to flux the ore; thus

$$\frac{9.48 + 0.39}{100} \times 1.759 = 0.17361 \text{ tons of slag from ore.}$$

$$\frac{54.38}{100} \times 0.38194 = 0.20769 \text{ tons of slag from stone.}$$

0.38130 total tons of slag from ore and stone.

Fuel consumption per ton of pig iron:

For the formation and melting of slag $0.38130 \times 0.25 = 0.09532$ parts of carbon are required.

For reduction, impregnation and melting of pig iron per gross ton containing 1 per cent. of silicon = 0.66000 parts of carbon are required.

Total carbon required for pig and slag 0.75532

Available carbon in coke = 79.05 per cent.

Therefore $\frac{0.7553}{0.7905} = 0.9554$ gross tons of coke are required per ton of pig = 2,140 pounds of coke.

Allowing 5 per cent. for braize, 2,140 lb. of coke in the furnace represents 2,252 pounds purchased at $5.25 per net ton.

Total limestone required per ton of pig:

For the ore	0.38195	gross tons
For the coke $0.955 \times .2419$	0.23101	" "
Total stone per ton pig	0.61296	" "

Costs:

The fuel per ton pig will cost 1.126 net tons @ 5.25.....	$5.91
Limestone, 0.613 gross tons @ $0.75 per ton	0.46
Fixed charges	2.25
Total cost pig iron, exclusive of ore	$8.62
Maximum cost of iron allowable	$16.00
Cost of iron, exclusive of ore	8.62
Value of 1.759 gross tons of ore	$7.38

or $4.19 = value per gross ton of the Lake Superior ore delivered.

Temagami Briquettes

Now consider the case of the Temagami briquettes.

The amount of flux needed and slag formed is calculated as follows:

Acids.		Bases	
Silica	8.50	Lime	—
Alumina	—	Magnesia	—
	8.50		—

Less 1.42 reduced to silicon in the pig iron.

7.08 acids to be fluxed.

$7.08 \times 1.083 = 7.667$ bases needed.

$7.667 \times 2.2 = 16{,}867$ pounds of stone required per 100 pounds of briquettes.

And as $\frac{95.00}{63.60} = 1.493$ tons of briquettes are required to make 1 ton of pig iron, then $1.493 \times 0.16867 = 0.25182$ tons of stone required per ton of pig iron.

The weight of slag formed will be:

$\frac{7.68}{100} \times 1.493 = 0.105704$ tons of slag from the briquettes,

$\frac{54.36}{100} \times 0.25182 = 0.13693$ tons of slag from stone.

Total = 0.242634 tons of slag from briquettes and stone.

Fuel consumption per ton of pig iron:

For the formation and melting of slag 0.24263×0.25 parts of carbon are required.	0.06065
For reduction, impregnation and melting of pig iron per gross ton containing 1 per cent. of silicon parts of carbon are required	0.66000
Total carbon required for pig iron and slag.	0.72065

Available carbon in the coke = 79.05 per cent.

Therefore $\frac{0.72065}{0.7905} = 0.911$ gross tons of coke required per ton of pig iron = 2,040 pounds of coke, and allowing 5 per cent. for braize, 2,040 pounds of coke in furnace represent 2,147 pounds purchased at $5.25 per net ton.

Total limestone required per ton of pig iron:

For the briquettes	0.25182 gross tons.
For the fuel 0.911×0.2419	0.22037 " "
Total stone per ton pig iron	0.47219 " "

Costs:

The fuel per ton pig will cost, 1.073 net tons @ $5.25	$5.63
Limestone per ton pig, 0.472 gross tons @ $0.75	.36
Fixed charges per ton pig iron	2.25
Total cost of pig iron, exclusive of briquettes	$8.24
Maximum cost of iron allowable	$16.00
Cost of iron, exclusive of briquettes	8.24
Value of 1.493 gross tons of briquettes	$7.76

or $5.20= value per gross tone of Temagami briquettes delivered.

The Ore Samples

The experimental tests made in 1907-8 were carried out with small samples of ore not exceeding 25 pounds in weight, so that the results obtained, although encouraging, were certainly not conclusive as regards the merits of the process for the successful

concentration of Ontario ores. It was decided, therefore, to carry out the present experiments at the Kingston School of Mines, upon a larger scale, with samples of at least three tons, thereby obtaining more accurate representation of the crude ores, and at the same time securing material enough to put the tests through in greater detail.

In the selection of samples an attempt was made to procure ores that varied, not only in chemical analysis, but also in physical structure, the varieties thus obtained illustrating the characteristics of the more prominent low-grade magnetites, and affording demonstration of the fact that the concentration of each ore is a particular problem in itself.

Following is a list of ores that were received and tested, the localities from which they came, and the names of the people responsible for their shipment:

Ore.	Locality.	Name of Sender.
Temagami	Temagami Station	Thos. B. Caldwell, Lanark.
Moose Mountain	Township of Hutton	Moose Mountain, Ltd., Sudbury.
Coe Hill	County of Hastings	George Collins, Trenton.
Calabogie	County of Renfrew	Thos. B. Caldwell, Lanark.
Radnor	County of Renfrew	Canada Iron Corporation, Montreal.

The sample of Temagami jaspilyte fairly represents ores of similar character that are found in many localities throughout the northern townships. So far as is known, no considerable body of hematite has been discovered in association with the jaspilyte formations of Ontario, although similar formations on the Vermilion range in Minnesota are at times accompanied by large bodies of rich hematite. If nature has been neglectful in this respect with our formations, she has certainly not been niggardly with her supply of crude jaspilyte, and therefore it is a matter of some importance to determine whether or not these lean ores can be considered an asset from the standpoint of concentration. The sample sent in by Mr. Caldwell was taken from several test pits on the property, and may be considered a fair average of the range. Analyses show the iron content to be about 37 per cent., with sulphur and phosphorus both low. Physically the ore (if such it may be called) consists of very fine-grained magnetite, alternating in narrow bands of one-eighth of an inch to two inches in thickness, with bands of quartz of about equal thickness, which are white or grey chert, or red or black jasper.

The sample of silicious ore from Moose Mountain, in the township of Hutton, is similar in analysis to the Temagami jaspilyte, but instead of presenting the banded structure of the latter, the iron and silica are evenly distributed throughout, and the crystallization is so fine that excessive pulverization is required to liberate the minute particles of magnetite. The main point in concentrating Temagami and Moose Mountain ores is the elimination of silica; at the same time keeping both sulphur and phosphorus below the Bessemer limit.

The sample of Coe Hill ore was obtained through Mr. George Collins, manager of the Central Ontario railway. This ore may be classed as a high sulphur magnetite, as it contains nearly two per cent. of that impurity. The sulphur exists in the form of magnetic pyrites, pyrrhotite, and, as such, is difficult to remove by magnetic separation. Phosphorus is low, the crude containing in the neighborhood of not more than 0.03 per cent. The iron content of the sample submitted was a little over 52 per cent., so that the ratio of crude units per unit of concentrate will not be high. The ore is crystalline, slightly granular, and if the sulphur were in the form of ordinary iron pyrites instead of the magnetic variety, the problem of concentrating would be simplified.

Sample No. 4, from the Tommy R. pit at Calabogie, was sent in by Mr. Thos. B. Caldwell. This ore is a fair type of many similar low-grade magnetites found along the Kingston and Pembroke railway. Its iron content is nearly 42 per cent., with sulphur and phosphorus both present in objectionable, although not excessive, amounts,

0.139 per cent. of the former and 0.17 per cent. of the latter. Very little iron pyrites can be seen in hand specimens, and it is probable that if most of the sulphur exists in the form of FeS_2, it is in very minute particles. The physical structure of the ore is crystalline, and presents a distinct schistose appearance, in which particular it differs from the majority of eastern Ontario ores.

The sample of Radnor ore was sent in by The Canada Iron Corporation, from their mine of that name in Grattan township, county of Renfrew. Radnor is a coarse, crystalline ore, distinctly granular, and in this respect is an exception to the general run of eastern Ontario ores. Analysis shows that it is somewhat similar in composition to Calabogie, being low in iron, and containing sulphur and phosphorus in appreciable quantities. From the physical structure of Radnor crude it would appear that relatively coarse crushing, with subsequent magnetic concentration, would yield a concentrate of high order, and the tests with this ore proved that assumption to be correct.

Both Calabogie and Radnor ores are examples of crude material that require not only the elimination of silica, but also the removal of sulphur and phosphorus. With Radnor ore this was accomplished easily, without excessive grinding, and although Calabogie yielded a first-class concentrate, it was more difficult to obtain. The concentration of Coe Hill crude is a problem in itself. Not only is the sulphur content prohibitory, but the percentage of insoluble matter is also a serious detriment. Without the insoluble, the ore would probably answer to the Gröndal method of treating pyrites residues. However, as both sulphur and insoluble matter are present in excessive amounts, the only alternative is magnetic separation to eliminate silicious gangue, and, if possible, some sulphur; then, as the concentrates would still contain too much sulphur, a subsequent calcining and agglomerating of the fine material would be necessary.

Outline of the Testing Work Attempted

Before giving detailed descriptions of the tests carried out with the different samples, it will be advisable to explain the general methods followed throughout the work, and indicate the points upon which the investigation rested.

In the first place, the most important point is the attainment of a high iron content in the heads product, consistent with the percentage of magnetite saved in the concentrate, and the percentage lost in the tailings. In direct relation to the foregoing is the number of crude units required to make one unit of concentrate, *i.e.*, the ratio of concentration.

Secondly, the elimination of sulphur, phosphorus and silicious gangue material to uniformly low percentages that would admit of listing the concentrates as first-class Bessemer ores.

Thirdly, the extent to which crushing and pulverizing had to be carried, to free constituent minerals in the crude, so that the first two requirements could be attained.

Fourthly, the effect of crushing the crude to a certain point, and then sizing the crushed ore by passing it over screens of different mesh, thereby assembling particles of about the same size, irrespective of specific gravity, the practical effect of which is a greatly increased efficiency in the subsequent magnetic separation. Incidentally, this preliminary crushing and sizing would indicate the relative hardness of the magnetite and gangue rock by the percentage of iron contained in different sizes, and at the same time illustrate the general crushing quality of the several ores.

Fifthly, ascertaining by sieve test the relative proportion of fines that are produced in concentrates by the dry process, as an indication of the possibility of smelting such concentrates without the need of briquetting or nodulizing.

Sixthly, the possibility of briquetting and desulphurizing concentrates produced by the wet process.

Machines Used in Making the Tests

1 Blake crusher, 10 x 7 inches;
1 Set Cornish rolls, 16 inches diameter;
1 Krupp dry ball mill, equipped with Nos. 10, 20, 40 and 60 mesh screens;

1 Colorado Iron Works impact screen, equipped with Nos. 4 x 3, 8 x 4, 10 x 6, 12 x 8, 16 x 12, 20 x 16, 24 x 20, 30 x 24 and 40 x 30 mesh screens;

1 Abbe Engineering Co. pebble mill (small size);

1 Complete set of laboratory testing screens;

1 Drum magnetic separator, built in the School of Mines workshops during the winter of 1907-1908. The exciting field of this machine consists of 12 stationary electro magnets, carried on a cast iron spider, and enclosed in a brass drum 14 inches across the face and 18 inches in diameter, the drum being protected by a thin rubber sleeve. The electro magnets have a capacity of 10 amperes at 110 volts, and are arranged in a series of alternate polarity, the position of the field being altered at will by means of an outside arm attached to the spindle carrying the magnets. The drum is made water-tight, and may be used in either of two box wells, placed side by side for dry or wet concentration, an overhead travelling trolley being provided to lift the drum from one box to the other. Power for rotating the drum is supplied by a ¾-h.p. electric motor.

1 Belt Magnetic Separator, of the Ball and Norton belt type.

This machine was built during the winter of 1908-1909, in the School of Mines workshop, under the supervision of L. W. Gill, Professor of Electrical Engineering. The exciting field consists of three powerful horse-shoe electro magnets, suspended between the pulleys carrying the 12-inch take-off belt. The magnets have a total capacity of 15 amperes at 110 volts. Terminal wires are so arranged that the polarity of each and every magnet can be reversed at any time, and the strength of each magnet, being controlled by a separate rheostat, facilitates the operation of the machine in making a three part separation, *i.e.*, heads, middlings and tailings. The crude ore may be fed by the ordinary belt feed, as in the Ball and Norton type, or by means of a slotted shaking table operating beneath the take-off belt. Power for driving the take-off belt, and feeding arrangement, is supplied by a ¾-h.p. electric motor.

1 Feed bin, holding about 1,200 lbs. of ore, feed being controlled by an ordinary 12-inch roller, driven at uniform speed by a ⅛-h.p. electric motor.

Preparing the Ore for Separation

Preliminary Crushing:—The shipments of ore, as received, were broken by the Blake crusher to about 1-inch size, and then sent to the Cornish rolls, where the material was reduced to ¼- or ⅛-inch, the discharge from the rolls passing over a 4 x 3 or 6 x 4 impact screen, oversize being returned to the rolls until all material was reduced to the required size.

Sampling and Weighing:—The crushed ore was then piled on a sheet-iron floor, and sampled by the ordinary process of coning and quartering, the whole amount being so treated, and reduced by successive quarterings until a sample of about 10 lb. was obtained. This sample was bagged and marked with the name of the ore and the letter A, indicating that it was the general sample of that particular shipment. The main bulk of crude was then sacked and weighed.

Drying:—No attempt was made to dry the crude ore. All shipments were received in bags or barrels, thus affording protection against excessive moisture, and it was found that the subsequent crushing and sizing resulted in removing any contained moisture to a fraction of one per cent. This does not mean that drying could be dispensed with in commercial dry separation of these ores. The conditions under which the tests were carried out were favorable for the elimination of moisture, but it is not at all likely that such conditions would exist in actual practice.

Classifying for Dry and Grinding for Wet Separation

After weighing, the crude was divided into two portions, approximately two-thirds being taken for dry separation, and one-third for wet separation. The portion of crude for dry separation was then sent to the impact screens. The first screen used, being,

of course, the finest, removed the dust particles, the oversize being returned to a screen of larger mesh, removing the next size of particles, oversize being fed to a screen of still larger mesh, and so on until the whole of the crude had been classified according to size of particles. Each grade or size was then sampled by the same method described above for the original crude, the samples marked with the name of the ore, and a designating number corresponding to the size of the material. The different sizes were then sacked and weighed, and the percentages of each size calculated with relation to the original weight of crude.

Screen Schedule

The following schedule shows the size of different screens used throughout the testing work. For comparison with the standard sizes adopted by The Institution of Mining and Metallurgy:—

Screens used.	Mesh per linear inch.	Decimal size of wire, inch.	Size of opening, inch.	Screens used.	Mesh per linear inch.	Decimal size of wire, inch.	Size of opening, inch.
Impact Screens, Colorado Iron Works.	4 x 3	0.047	0.203	Ball Mill Screens, W. S. Tyler Co.	10	0.047	0.053
	6 x 4	0.035	0.132		20	0.025	0.025
	8 x 4	0.035	0.090		40	0.0135	0.0115
	10 x 6	0.028	0.072		60	0.0080	0.0091
	12 x 8	0.023	0.06	Testing Screens, W. S. Tyler Company.	10	0.018	.....
	16 x 12	0.018	0.0445		20	0.0165	0.0335
	20 x 16	0.017	0.033		40	0.01025	0.0147
	24 x 20	0.014	0.027		60	0.0075	0.0091
	30 x 24	0.014	0.0195		80	0.00575	0.00675
	40 x 30	0.009	0.0160		100	0.0045	0.0055

The portion of crude for wet concentration was then split into two or three equal lots, each lot being ground separately in the Krupp ball mill, using a 10-mesh screen for one lot, a 20-mesh screen for the second, and a 40-mesh screen for the third. It was not considered necessary to sample the ball mill product, as each lot was a portion of the original crude, and therefore represented by the original sample A.

Concentrating

Dry Separation:—In making these tests the belt machine was used exclusively, its capacity being greater, and adjustments easier of regulation and control than the drum machine. Each size or grade of ore was put through separately, the machine being adjusted for the production of tails that were discharged as waste, heads that were accepted as final, and middlings that required re-grinding and re-separation. The middlings were then re-treated until the iron content fell below 15 per cent. in the case of Temagami, and below 12 per cent. in all other cases. The final concentrates and final tailings were caught in respective bins, and were weighed and sampled, the samples being selected by the same process described for the crude ore. Two samples of each concentrate were taken, one for chemical analysis, and one for sieve test to determine the relative percentage of fine and coarse particles.

Wet Separation:—Wet separation was carried out with the drum machine arranged to work on the Gröndal system. It was found that the exciting field of this machine was too weak to effect a clean separation of magnetite from gangue at one pass. Accordingly the height of the drum above the water and the field strength were adjusted to make clean heads, and the tailings were re-passed until the maximum of

free magnetite had been saved. This was usually accomplished in two, and less frequently in three, re-passings of the tails. The final concentrates and final tails being collected in respective settling tanks, the water was then drained off, and the products dried, weighed and sampled. This method of concentrating is exactly the reverse of that followed in the Gröndal process. In the Swedish system, the separating machines are powerful enough to make clean tailings at once, and the head products from the first operation, sometimes containing free gangue mechanically entangled, are re-passed to eliminate this gangue in a secondary machine. If the concentrate from the secondary machine is still too low in iron, re-grinding may be resorted to, followed by a final concentration. Only two of the ores tested, namely, Temagami and Moose Mountain, required intermediate grinding, and re-concentration of the heads; with the rest no difficulty was experienced in obtaining concentrates well over 60 per cent. in iron and low in phosphorus and sulphur (with the exception of Coe Hill) without excessive grinding.

Analyses

All the analyses were made by Mr. N. L. Turner, chemist in charge of the Provincial Assay Office, Belleville.

Samples of crude marked A were analyzed for soluble iron, insoluble residues, sulphur and phosphorus. The percentage of magnetite was calculated from the soluble iron after deducting the percentage of iron present in iron pyrites or pyrrhotite. Qualitative tests were made for titanium, but this element was found to be absent in all the samples. Samples of the classified crude marked 1, 2, 3, etc., were analyzed for soluble iron, insoluble residues and sulphur, magnetite percentages being calculated from the soluble iron, with correction for iron sulphides. Samples of concentrates were analysed for soluble iron, insoluble residues, sulphur and phosphorus, magnetite percentages calculated as previously described. Samples of tailings were run for soluble iron; and sulphur magnetite calculated from soluble iron with sulphide correction. Samples of briquetted concentrates were analyzed for total iron, silica, sulphur and phosphorus.

Tabulating the Results of Concentration

With the description of the test on each ore will be found a "mill log sheet," upon which are entered all the data pertaining to that particular test. This method of presenting the results will, it is hoped, be of assistance to the reader who has not the time or the inclination to read through the full printed matter. An effort was made to make the log sheet as simple and untechnical as possible, and at the same time to illustrate the relative efficiency of wet and dry separation for each ore.

At the head of the log sheet will be found the number of the test and the name of the ore treated, the extent to which crushing was carried, and the general analysis of the original crude. The left hand side of the sheet is devoted to dry separation; the weight of ore for dry test is given, and the method of classifying by the impact screens is illustrated. The table under the heading "Dry Concentration" contains all data of crude ore, concentrates, tailings, dust loss, and efficiency of separation. Under "Crude Ore" will be found the numbers of the classified samples, their grade according to mesh size, the weight of each grade, and the percentage of each grade with respect to the original weight of crude. The analysis of each grade is given and the total averages at the foot that should check, within reasonable accuracy, with the results of analysis of sample A. Under "Concentrates" will be found the weight and percentage of concentrate obtained from each grade, together with the analysis, the totals and averages being entered at the foot of the table. Under "Tailings" are entered the weight and percentages, with analysis. Sulphur determinations are given only in those cases where the original ore was high in that element. The figures under "Dust Loss" represent the weight and percentage of material lost during the test, and were obtained by subtracting the weight of concentrates plus tailings from the

original weight of crude. Under "Efficiency" will be found the percentage of magnetite saved in concentrate and lost in tailings. Percentages of magnetite lost were obtained by subtracting the percentage saved from 100, and represent the total loss. Percentages of magnetite saved, and units of crude required per unit of concentrate were calculated from the analyses according to equations given in the last report.[2] As a check upon the calculations just described, a recapitulation of the results of dry concentration is added. The weights of magnetite in the crude, concentrate, and tailings are calculated from the actual weights, the weight and per cent. of magnetite in the dust obtained by subtraction. The percentages of saving and loss thus obtained show very close approximation to the figures obtained by the equations mentioned above.

On the right-hand side of the log sheet the data pertaining to wet concentration is given. The weight of crude and the extent of grinding for each portion of crude in the ball mill is indicated. Under "Crude Ore" are entered the weights, the mesh size, and the analyses. Under "Concentrates" are given the weights, percentages and analyses of the head products, and under "Tailings" the weights, percentages, and analyses of the tails. Figures representing slime loss were arrived at by the difference in weight between the original crude and the concentrates plus tailings. Efficiency results were calculated by the same method described for dry concentration. A recapitulation for the sample that yielded the best concentrate is added, the calculations being the same as described for dry separation, and the slime loss figures obtained by subtraction.

Metallic Equivalent to Magnetite

The following table will be found convenient in ascertaining the percentage of magnetite corresponding to any percentage of iron. In using the table, correction should be made for the amount of iron present in any form other than Fe_3O_4:—

Per Cent. Iron. Fe	Per Cent. Magnetite. Fe_3O_4	Per Cent. Iron. Fe	Per Cent. Magnetite. Fe_3O_4
.01	.013808	29.0	40.04408
.02	.027616	30.0	41.42491
.03	.041424	31.0	42.80574
.04	.055233	32.0	44.18657
.05	.069041	33.0	45.56740
.06	.082849	34.0	46.94823
.07	.096658	35.0	48.32906
.08	.110466	36.0	49.70989
.09	.124274	37.0	51.09072
.10	.138083	38.0	52.47155
.20	.276166	39.0	53.85238
.30	.414249	40.0	55.23321
.40	.552332	41.0	56.61404
.50	.690415	42.0	57.99487
.60	.828498	43.0	59 37570
.70	.966581	44.0	60.75653
.80	1.104664	45.0	62.13736
.90	1.242747	46.0	63.51819
1.0	1.380830	47.0	64.89902
2.0	2.76166	48.0	66.27985
3.0	4.14249	49.0	67.66068
4.0	5.52332	50.0	69.04151
5.0	6.90415	51.0	70.42234
6.0	8.28498	52.0	71.80317
7.0	9.66581	53.0	73.18400
8.0	11.04664	54.0	74.56483
9.0	12.42747	55.0	75.94566
10.0	13.80830	56.0	77.32649

[2] 17th Rep. Bur. Min., 1908, p. 229.

Metallic Equivalent to Magnetite.—Continued.

Per Cent, Iron. Fe	Per Cent. Magnetite, Fe_3O_4	Per Cent. Iron. Fe	Per Cent. Magnetite. Fe_3O_4
11.0	15.18914	57.0	78.70732
12.0	16.56997	58.0	80.08815
13.0	17.95080	59.0	81.46898
14.0	19.33163	60.0	82.84981
15.0	20.71246	61.0	84.23064
16.0	22.09329	62.0	85.61147
17.0	23.47412	63.0	86.99230
18.0	24.85495	64.0	88.37313
19.0	26.23578	65.0	89.75396
20.0	27.61661	66.0	91.13479
21.0	28.99744	67.0	92.51562
22.0	30.37827	68.0	93.89645
23.0	31.75910	69.0	95.27728
24.0	33.13993	70.0	96.65811
25.0	34.52076	71.0	98.03894
26.0	35.90159	72.0	99.41977
27.0	37.28242	72.42(Theoretical)	99.999718
28.0	38.66325		

Test No. 1.—Temagami Jaspilyte

The most prominent physical characteristic of this ore is its banded structure. Hand specimens show clearly the alternate bands of magnetite and jaspery material varying from one-eighth of an inch to two inches in thickness. Some of these bands of magnetite are sharply defined and consist of almost pure Fe_3O_4, others are of a splintery nature intermixed with fragmental jasper, but the majority consist of minute crystals of magnetite associated with 20 to 30 per cent. of silicious gangue particles.

In the preliminary crushing of the ore it was found that the banded structure was of material assistance, affording lines of weakness that facilitated the reduction to a point where the major portion of magnetite bands were freed from adhering jasper. After this point had been reached, it became more difficult to pulverize the material to a degree where complete disintegration of the constituent minerals was effected. This is fully illustrated in the accompanying log sheet, which shows that the dry concentrate from 6-mesh material contained but 50 per cent. of iron, while concentrates obtained by the wet process after excessive pulverizing contained over 64 per cent. of iron. The extent of crushing obtained by breaking the ore to 1-6 inch is illustrated by the percentage figures under "Crude Ore" in the table of dry concentration, over 55 per cent. remaining larger than 10-mesh, with only 18.89 per cent. passing a 40-mesh screen; the iron content of the 40-mesh material falling to 31.24 per cent., affording evidence of the fact that the magnetite bands offer a greater resistance to crushing than the bands of non-magnetic material.

The results of dry separation are not satisfactory. Too much silica remains in the concentrate, and the percentage of phosphorus instead of being reduced is increased. The dry concentrates would make a very fair non-Bessemer silicious ore, the sieve test showing that the proportion of fines to coarse is not excessive. But it is doubtful whether the price obtained for such concentrates would admit of any profit. The percentage of magnetite saved is low. This could be bettered by finer crushing, but the saving effected would be at the expense of the granular character of the concentrates.

Concentration by the wet process affords much better results in the production of factory. The separation of 20-mesh material yielded heads that were on about a par a richer head product, but the saving of magnetite made cannot be regarded as satis-

factory. The separation of 20-mesh material yielded heads that were on about a par with the results of dry concentration. The next size, 40-mesh, yielded heads but one per cent. higher than those obtained from the 20-mesh. It was therefore necessary to pulverize finer than 40-mesh to obtain first-class concentrates. Following the methods adopted in the Gröndal process, the heads from the 40-mesh material were re-ground in the pebble mill to 60-mesh, and re-concentrated; this resulted in raising the iron content to nearly 60 per cent., reducing silica to about 15 per cent. and phosphorus to 0.015 per cent. These concentrates were again returned to the pebble mill and ground to 100-mesh, and the finely divided pulp on re-concentration yielded heads that contained approximately 65 per cent. of iron, and were accepted as satisfactory.

In the recapitulation of the results of this test, 2-2 cc., it will be noted that only 84.519 per cent. of the magnetite was saved. The finely divided pulp contained much magnetite in slimey condition, and it was found very difficult to save this, with the machine at hand. If magnetic slimers[3] had been available, there is no doubt that the slime loss would have been reduced materially, and the proportion of magnetite saved proportionately increased. Conclusions may be summed up as follows: The ore will crush fairly easily to a point where the banded structure is destroyed, beyond this, effective disintegration will be expensive unless cheap power is available. Dry concenration will not yield a Bessemer concentrate and will not save more than 85 per cent. of the original magnetite unless finer crushing is resorted to. A first-class Bessemer concentrate can be obtained by the wet process, after re-crushing the middling product to about 100-mesh. The percentage of magnetite saved will be low, and slime loss heavy unless magnetic slimers are employed.

In actual practice the scheme of treatment might be as follows: Dry crushing to about ¼-inch, followed by wet pulverizing in a ball mill to, say, 40-mesh; the ground pulp flowing to magnetic slimers, which would remove a large portion of non-magnetic slimes. From the slimers the pulp would go to the preliminary separators, concentrates from these first machines being re-ground in tube mills to 100-mesh or thereabouts, and re-concentrated in a secondary line of separators yielding the final heads product. It is almost unnecessary to add that the concentrates obtained by this process would require briquetting or nodulizing.

Test No. 2.—Moose Mountain

Moose Mountain silicious crude, although very similar to the Temagami jaspilyte in chemical analysis, differs radically in physical characteristics. The banded structure in the sample tested is totally absent, and in its place we have a close-grained, tough, compact rock consisting mineralogically of crypto-crystalline magnetite, silica, and amphibolitic material, the magnetite being evenly distributed throughout the mass. Tests made last year with this ore proved that dry separation yielded indifferent results and therefore, it was decided to make no detailed experiments in dry concentration. Much of the low grade Moose Mountain ore has, however, a banded structure, although, as already noted, such a banded structure does not occur in the sample tested.

The whole sample was crushed to 1-6 inch by the Blake crusher and Cornish rolls, and then divided into three portions that were pulverized to three different sizes in the ball mill. The ore was very difficult to crush, its tough, compact structure offering a maximum of resistance, and in putting through the three thousand and odd pounds of crude, the crusher and rolls suffered more abrasion than they did from all the rest of the ores together.

To illustrate the effect of dry concentration, 300 pounds of the 60-mesh crude was put through the dry separator, and although the heads were re-passed four times, the highest iron content obtainable was 51.40 per cent. Tailings were low enough in iron, and the percentage of recovery satisfactory, but it is apparent that as fine grinding is necessary, it will be more advantageous to concentrate wet, thereby making a heads product of greater value.

[3] 17th Rep. Bur. Min., 1908, p. 237.

The wet concentration of the 20-mesh size resulted in obtaining a concentrate too low in iron to be merchantable. Separation of the 40-mesh size yielded a concentrate that contained only 49.14 per cent. of iron, which was also considered too low, although it will be noted that the phosphorus content had dropped to 0.021. The separation of the 60-mesh material resulted in a concentrate containing 53 per cent. of iron, with sulphur 0.02 and phosphorus 0.015 per cent. This concentrate was then re-ground in the pebble mill, and the pulp after re-concentration yielded a 64.62 iron concentrate with sulphur 0.02 and phosphorus 0.008 per cent., a result that was accepted as satisfactory.

Recapitulation of the test on sample 3-3c. showed that over 91 per cent. of the original magnetite was saved, the balance being lost in the tailings and slimes, the slime loss in the case of this ore being considerably less than in the case of the Temagami jaspilyte.

The wet process is evidently the method that should be followed in concentrating this and similar ores, the scheme of treatment being approximately similar to that outlined for the Temagami ore, although the extent to which preliminary crushing should be carried will be greater and the costs relatively higher.

Test No. 3.—Coe Hill

Coe Hill ore is crystalline, slightly granular magnetite, containing a considerable amount of pyrrhotite (magnetic pyrites), sulphur being present to the extent of nearly 2 per cent. The non-magnetic gangue consists of silica, dark colored mica, hornblende, and a small proportion of calcite. Phosphorus is low, the average being about 0.03 per cent.

The ore breaks easily. The effect of crushing to ¼ inch resulted in 30 per cent. of the material being fine enough to pass a 40-mesh screen, with a little over 51 per cent. larger than 10-mesh. If preliminary crushing had been carried to, say, 1-6 inch, the percentage of dust particles formed would have been much higher. This was to be avoided, however, as it would have interfered seriously with the removal of sulphur.

The results of dry concentration show first that sulphur cannot be entirely eliminated. By careful adjustment of the separating machine about 25 per cent. of the total sulphur in the crude can be got rid of with the tails, without undue loss of iron; but if it is attempted to remove more than this amount the magnetic fields would require to be weakened to a point where considerable magnetite would be lost. It will be noted that sulphur was more easily got rid of in the separation of the larger-sized material. The concentration of the 40-mesh material increased the sulphur from 2.21 to 2.41 per cent., whereas concentration of the 4-mesh size reduced the sulphur from 2.00 to 1.07 per cent. This is accounted for by the fact that smaller particles of pyrrhotite are by reason of their weight more strongly influenced than larger particles and hence pass into the heads more readily. The phosphorus on the other hand is reduced considerably, more so than is actually necessary. However, this element is characterized in the best ores by its presence in very small amounts, and an extremely low phosphorus ore finds a ready market. The percentage of iron in the final concentrates is hardly 10 per cent. higher than that of the crude, although the percentage of insoluble matter was reduced by more than one-half. This is rather disappointing as a higher iron content was expected and would enhance considerably the value of the concentrates. Finer crushing might have raised the iron content, but at the same time would have undoubtedly raised the percentage of sulphur. In this connection it is interesting to note that concentrates from the 40-mesh crude were not only higher in sulphur, but also lower in iron than the concentrates from the 20-mesh crude, showing that dust particles are a serious detriment to clean separation.

The sieve test on the dry concentrates proves that 22 per cent. of the material is finer than 80-mesh, so that, apart from the high sulphur content, the concentrates are

not in condition for economical smelting. Nodulizing these concentrates would undoubtedly reduce the sulphur to probably 0.05 per cent. or under, and at the same time agglomerate the fine material.

Recapitulation of the results of dry concentration indicates a saving of over 98 per cent. of the original magnetite. This is due to the small ratio of concentration; only 1.187 units of crude being required to produce 1 unit of concentrate. By increasing this ratio, *i.e.*, allowing more magnetite to escape with the tails, it is probable that a higher grade concentrate would result. The percentage of loss allowable is, however, a function of the cost of the crude, so that in the commercial separation of this ore the mining costs would be an important factor in determining the grade of concentrates produced.

Concentration by means of the wet process yielded a heads product higher in iron, lower in gangue, sulphur practically the same, and with a trace of phosphorus. The 20-mesh material gave a slightly better concentrate than was obtained from the 10-mesh size, although a better saving was effected in separating the larger material. The recapitulation for sample No. 1 proved a saving of over 96 per cent. of the original magnetite, with a loss of 2.8 per cent. in the tailings and less than 1 per cent. loss in slimes.

The concentrates produced by the wet process of separation would require briquetting or nodulizing, and it is probable that the amount of desulphurizing required would have a distinct effect upon the output of either the briquetting furnace or nodulizing kiln.

Test No. 4.—Calabogie

Calabogie is a fairly good representation of many of the low-grade magnetites found along the Kingston and Pembroke railway. The ore is crystalline, exhibiting a somewhat schistose structure, and consists of fine-grained magnetite, green hornblende, quartz and calcite, with a little dark colored mica. Sulphur is present in the form of iron pyrites, but very little pyrites can be seen in hand specimens, and the crude contains only 0.139 per cent. of that obnoxious element. Phosphorus is present to the extent of 0.17 per cent., and is apparently intimately associated with the magnetite, as its removal is not easily accomplished.

Crushing to 1-6 inch was accomplished without difficulty, the proportion of fines passing a 40-mesh screen being a little over 30 per cent., leaving over 51 per cent. larger than 10-mesh, a result similar to that obtained in crushing Coe Hill, and as in the case of Coe Hill the sulphur was found to be concentrated to some extent in the 40-mesh material.

Dry concentration resulted in obtaining a non-Bessemer concentrate, phosphorus in the heads product being reduced to 0.099 per cent. from 0.17 per cent. in the crude, a total reduction of only 42 per cent. Sulphur was almost entirely eliminated. The iron was increased to a little over 62 per cent., but this was accomplished only by close adjustment of the separating machine and by making a large middling product to be returned to the crushers and then re-concentrated, the practical effect of which was to make a final concentrate containing over 28 per cent. of material fine enough to pass a 100-mesh screen. Hence nodulizing would be necessary to put these concentrates in shape for furnace use.

Recapitulation of the dry tests shows a saving of over 95 per cent. It would be possible to lower this saving to say 90 per cent. and obtain a concentrate higher in iron, but it is doubtful if phosphorus could be reduced to within the bessemer limit, and of course a reduction in the percentage of magnetite saved means increased cost per ton of product.

Wet separation of the crude yielded a much better heads product. By this method the phosphorus was reduced to 0.04, and the iron raised to 62.81 per cent. making a first-class bessemer concentrate. It will be noted that crushing to 20-mesh was sufficient to effect considerable reduction of phosphorus. Crushing to 40-mesh raised the iron to a little over 1 per cent. higher, but did not have any additional effect in the reduction of phosphorus. If it were desired to make a very high iron and low phosphorus concentrate, it is probable that tube mill grinding to 60-mesh would be necessary.

Recapitulation for sample 3, shows a saving of original magnetite of over 96 per cent., being 1 per cent. higher than the saving effected in dry work. Concentrates produced by the wet process would require either briquetting or nodulizing, and as practically no desulphurizing is necessary, the capacity of the furnace or kiln could be kept at a maximum.

Test No. 5.—Radnor

Radnor ore in physical characteristics differs radically from all the other ores tested. The ore treated is essentially a granitic gneiss impregnated with coarse granular magnetite, the gangue consisting of quartz, feldspar and hornblende. Both sulphur and phosphurus are present in approximately equal amounts, the percentages being 0.171 and 0.172 respectively. Very little pyrites can be seen in hand specimens, and apatite cannot be distinguished at all by the naked eye.

As would be expected from its granular structure the ore is easily disintegrated by crushing to 1-6 inch, forming a little over 28 per cent. of material fine enough to pass a 40-mesh screen, leaving 56 per cent. of the crushed, larger than 10-mesh. Sizing had apparently very little influence upon sulphur distribution, the sulphur content of the fines being about the same as that of the coarse.

With dry separation no difficulty was experienced in obtaining a high-grade Bessemer concentrate, the iron content of the heads being over 67 per cent, with sulphur at 0.033 per cent., and a trace of phosphorus. Recapitulation shows a saving of nearly 92 per cent. of the original magnetite, a result that should be approximated, if not equalled in commercial work. In the separation of this ore, the general method of making a middling product to be re-crushed and re-separated was followed throughout. On an average this middling product equalled 15 per cent. of the original crude, the retreatment resulting in making additional fine concentrates. If it were desired to make a final concentrate that could be smelted directly without nodulizing, it would be possible to reduce the re-treatment of middlings to say 10 per cent. or less of the original ore, thereby avoiding additional crushing and making less fines. This would, of course, yield a concentrate lower in iron, but it would still probably be within the bessemer limit.

Wet separation produced concentrates of slightly better grade with less loss of magnetite in the tailings, the percentage of magnetite saved being correspondingly higher. This is an item of some importance, for a slight difference in the saving of original magnetite will constitute an appreciable factor in the final cost sheets, more especially if the cost of crude delivered to the mill is relatively high.

Concentrates produced by the wet process will naturally require briquetting or nodulizing, but in this case, as in Calabogie, no desulphurization is required.

Briquetting and Desulphurization Tests

It has been pointed out in preceding pages that magnetic iron ore concentrates may be unfit for direct use in the blast furnace on account of their finely-divided character. Sometimes, also, these concentrates, although high in iron, contain too much sulphur to satisfy the furnaceman, and must therefore undergo a process of desulphurization.

When, therefore, the concentrates are finely divided, or contain an objectionable amount of sulphur, it is necessary that they should be briquetted or nodulized. Both the briquetting and nodulizing processes are efficient for the removal of sulphur, and, when carried out under proper conditions, will yield hard, porous briquettes or nodules, an ideal raw material for the blast furnace.

In order to show that the concentrates produced in the preceding tests were amenable to the briquetting and desulphurization process, experiments were carried out with samples of each of the concentrated ores. These briquetting tests were of necessity made on a small scale, and although they were extremely simple and lacked any elaborate details, they nevertheless prove that under proper conditions it is possible to briquette and desulphurize these concentrates without any added binder.

For the making of these tests the writer had no briquetting press or briquetting furnace, and was forced to utilize such apparatus as he had at hand. A die for forming the briquettes was made by boring a one-inch hole through a three-inch cube of cast iron, a plunger for this die being turned up out of mild steel, and fitted accurately to the bore hole. The briquettes were made by filling the die with slightly water-moistened concentrates, inserting the plunger and applying a pressure of 5,000 pounds to the square inch in a Reihke testing press. Briquettes made in this way were quite hard enough to stand ordinary handling, and were then taken to the briquetting furnace.

The furnace used consisted of an old gasoline assay furnace, fitted up with temporary bridge wall and roof, after the ordinary reverberatory type. The fuel consumed was gasoline, and although the capacity of this furnace was small and the temperature difficult of regulation, it answered fairly well. Some time was occupied in making preliminary experiments, with the view of ascertaining the range and extent of temperature required. It was possible to force the temperature of this little furnace to 1,450° C., but this degree of heat was seldom obtained during the experiments, as it was found unnecessary, a temperature of from 1,300° to 1,350° C. being quite sufficient for all purposes.

For the control and regulation of the heat Seger cones were utilized. These cones do not permit of any nice heat adjustment, but they were sufficiently accurate for the work at hand.

About eight hours' treatment in the furnace was found necessary for the production of well oxidized briquettes, the temperature during that time being gradually raised from the normal temperature of the laboratory to a final temperature of 1,300° or 1,350° C. After a few preliminary trials it was discovered that the heat should be raised very slowly for the first five or six hours, in order to effect a more or less complete peroxidation of the magnetite before sintering took place. When the heat was raised too quickly at the commencement of a test, a thin skin of magnetite sintered upon the outside of the briquette, effectively preventing oxidation of the interior, and, of course, putting an end to desulphurization. As stated previously, no nice temperature adjustment could be made. However, after the briquettes had reached a dull red heat, the temperature was elevated in steps of about 120° C. every hour, until a final temperature of 1,300° to 1,400° C. was attained; the furnace was held at this temperature for the space of an hour or so, then cooled down and the briquettes removed.

The briquettes made in the manner described above were found to be quite hard, and extremely porous. Oxidation had been carried to such an extent that no magnetism was displayed when tested with an ordinary six-inch steel horse-shoe magnet. Time did not permit of making any porosity tests, but it may be stated that the briquettes made from Temagami and Moose Mountain concentrates of 100-mesh fineness were so porous that they would absorb water like a piece of lump sugar.

For the making of briquettes of this size, 2½ inches long by 1 inch in diameter, from Temagami, Moose Mountain, Calabogie and Radnor concentrates, no excessive

treatment in the furnace was found necessary. Eight hours' time was sufficient to form well-oxidized and thoroughly desulphurized briquettes from the above concentrates. In the case of Coe Hill concentrates, which contained 1½ per cent. of sulphur, a longer exposure in the furnace was necessary, and accordingly briquettes of these concentrates received about ten hours' treatment.

Following are the analyses of the raw concentrates and the briquettes. It should be kept in mind that the concentrates were analyzed for soluble iron, and insoluble residues, whereas the briquettes were analyzed for total iron and silica.

	Concentrates.				Briquettes.			
Locality.	Iron.	Insoluble.	Sulphur.	Phos.	Iron.	Silica.	Sulphur.	Phos.
Temagami	64.77	9.73	Trace	0.007	63.60	8.50	Trace	0.006
Moose Mountain	64.62	9.02	0.02	0.008	63.86	8.07	Trace	0.006
Coe Hill	64.43	8.68	1.54	Trace	60.25	5.72	0.051	Trace
Calabogie	62.81	7.02	Trace	0.04	60.15	3.15	Trace	0.038
Radnor	69.98	2.49	0.02	0.006	65.92	1.89	Trace	0.005

General Conclusions

Considering the experiments as a whole, it has been demonstrated that first-class bessemer concentrates (with one exception) can be produced from the crude ores submitted for testing purposes, and it has been shown that all of these concentrates will form hard porous briquettes, more or less peroxidized and free from sulphur, when submitted to a process similar to the Gröndal system of briquetting.

The extent of crushing required to produce these concentrates varies from relatively coarse disintegration, to a fine degree of pulverization, and is governed entirely by the physical structure of the ores treated. With coarse granular magnetites of the Radnor type, concentration was accomplished without excessive grinding, and it may be safe to add that ores of similar character will yield similar results. Fine-grained cryptocrystalline ores of the Temagami and Moose Mountain types required grinding to 40- or 60-mesh, followed by preliminary separation, and subsequently a re-grinding to 100-mesh, with re-concentration of the preliminary heads before yielding a high-grade product. Ores of an intermediate crystallization, represented by Calabogie and Coe Hill, may be concentrated effectively by crushing to 40-mesh or thereabouts.

Sulphur, when present in the form of iron pyrites, FeS_2, can, in the majority of cases, be reduced to a very low figure in the concentrate. If present as pyrrhotite Fe_7S_8, its removal is difficult, and the best that can be expected is to produce a concentrate of sulphur content very little lower than the original percentage contained in the crude. If subsequent briquetting or nodulizing of the fines is required, almost complete oxidation of the sulphur will result, but the capacity of the briquetting furnace or nodulizing kiln will depend upon the extent of desulphurization desired.

No trouble was experienced in the removal of phosphorus below the bessemer limit. It is true that none of the ores tested would be considered high phosphorus, compared, for instance, with Port Henry magnetites;[4] but, so far as the knowledge of the writer extends, no magnetites of similar high phosphorus content are found in Ontario.

Dry concentration, with ores of Temagami and Moose Mountain character, will yield indifferent results, the chief obstacle being the effective removal of mechanically-entangled dust-particles, that render the production of high-grade concentrates very difficult, if not impossible. Jaspilyte ores will yield a fairly coarse-grained silicious concentrate, but require fine grinding, and the application of the wet process of separation, for a high-grade bessemer product. Fine-grained compact magnetites, similar to Moose Mountain, will not yield even a fair silicious concentrate unless pulverized to 60-mesh, and, like the jaspilyte ores, require additional grinding with wet separation before yielding bessemer concentrates.

[4] 17th Rep. Bur. Min., 1908, p. 245.

Ores similar to Coe Hill, containing much magnetic pyrites, but with low phosphorus content, are amenable to either dry or wet methods of separation, but sulphur will not be reduced materially, and the resulting concentrates must be desulphurized. Such high sulphur concentrates can be handled by either the Gröndal briquetting furnace or the nodulizing kiln, but, as stated previously, the capacity of either process will depend upon the extent of desulphurization desired.

Magnetites of a schistose structure, similar to Calabogie, containing no excessive amounts of sulphur and phosphorus, are amenable to dry separation for the production of non-bessemer concentrates, but will yield a bessemer product with grinding to 40-mesh and subsequent application of the wet process.

Coarsely crystalline ores of the Radnor type, containing no excessive percentages of sulphur and phosphorus, will readily yield a high grade bessemer concentrate, with either the dry or wet process, and will not require excessive grinding.

The Question of Cost

With experimental tests of this character it is impossible to arrive, within any degree of accuracy, at conclusions regarding costs of operation. As a general rule, it may be stated that costs of production will vary inversely with the scale of operations and the iron content of the ore treated, and directly as the cost of the crude delivered, and the extent of crushing required. The heaviest items will, in the majority of cases, be the cost of mining or quarrying the crude, and the cost of crushing for subsequent separation. In the case of many eastern Ontario deposits, the heaviest item will undoubtedly be mining cost, the extent of crushing required not being excessive. With ores of the Temagami and Moose Mountain types, crushing costs will run high, but as the deposits are of sufficient magnitude to permit of cheap mining, costs under this head should be comparatively low.

Reliable data pertaining to costs of crushing are difficult to obtain, and, when obtained, are uncertain in application to specific problems. For the reason that different ores are of widely different physical structure, it has been stated that crushing costs may be estimated at the rate of one cent per mesh, 20 cents per ton for 20-mesh, 60 cents for 60-mesh and $1.00 per ton for 100-mesh. The writer has had no experience in the application of this schedule, but, in so far as he can learn, it tallies approximately with the costs of crushing ores of average hardness.

[5] That the process of magnetic separation applied to the concentration of low grade Ontario iron ores is worthy of serious consideration cannot be doubted, and it is not too much to say that the outlook for the establishment of such an industry in Ontario is encouraging. Our blast furnaces are forced to operate with high-priced fuel imported from the United States, and, in the majority of instances, are burdened with an ore mixture that yields not more than 55 per cent. of pig iron. Over 70 per cent. of the iron ore smelted in Ontario furnaces is imported from the United States, due to the fact that native mines cannot supply the demand for either foundry or bessemer ores; indeed, at the time of writing there is but one Ontario mine producing bessemer iron ore, and in limited quantity.

That the production of high grade briquetted or nodulized bessemer concentrates would find a ready market there can be no doubt, and if a price of five to six dollars per gross ton for this material could be secured and maintained, there should be a comfortable margin of profit above the costs of production and transportation.

The writer wishes to make grateful acknowledgment of the assistance and advice rendered by the following members of the faculty of the Kingston School of Mines: L. W. Gill, Professor of Electrical Engineering; J. C. Gwillim, Professor of Mining Engineering; S. F. Kirkpatrick, Professor of Metallurgy, and Mr. George McKay.

[5] Magnetic Separation. By F. T. Snyder, Journal Canadian Mining Institute, Vol. VII.

SIEVE TEST ON TEMAGAMI DRY CONCENTRATES.

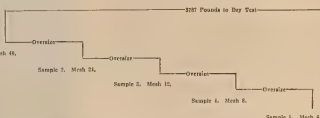
Showing Distribution of Material According to Mesh Size.

Concentrate from Sample.	Weight, Pounds.	Per Cent. Pass. 100 Mesh.	Per Cent. Pass. 80 Mesh.	Per Cent. Pass. 60 Mesh.	Per Cent. Pass. 48 Mesh.	Per Cent. Pass. 35 Mesh.	Per Cent. Pass. 10 Mesh.	Per Cent. Over. 10 Mesh.
4	331	57.80	7.73	8.80	26.10	.....	.....	.....
2	831	6.70	1.62	4.76	11.90	76.10	.....	.....
3	695	4.60	2.66	5.68	4.60	55.55	69.91	.....
4	834	5.12	1.55	1.95	3.05	6.34	11.51	88.49
4	740	5.11	1.63	3.15	3.07	6.33	8.84	91.16
Total Averages...	3,396	6.97	2.44	2.19	41.65	15.59	28.25	28.89

Mill Log of Test No. 1 on Temagami Crude.

Weight of Sample Received 5780 Pounds: Broken in Blake Crusher to 1 inch, thence to Cornish Rolls Crushing to 1-6th Inch.

Sampled (A).



Analyses of Sample A.

	Iron.	Magnesite.	Insoluble.	Sulphur.	Phosphorus.	Titanium.
Per Cent.	37.84	81.14	47.36	0.063	0.023	0.09



DRY CONCENTRATION.

Screen Number.	Through Mesh.	CRUDE ORE. Weight and Per Cent. Pounds.	CRUDE ORE. Weight and Per Cent. Per Cent.	CRUDE ORE. Analyses. Iron. Per Cent.	CRUDE ORE. Analyses. Magnetite. Per Cent.	CRUDE ORE. Analyses. Insoluble. Per Cent.	CRUDE ORE. Analyses. Sulphur. Per Cent.	CRUDE ORE. Analyses. Phosphorus. Per Cent.	CONCENTRATES. Weight and Per Cent. Pounds.	CONCENTRATES. Weight and Per Cent. Per Cent.	CONCENTRATES. Analyses. Iron. Per Cent.	CONCENTRATES. Analyses. Magnetite. Per Cent.	CONCENTRATES. Analyses. Insoluble. Per Cent.	CONCENTRATES. Analyses. Sulphur. Per Cent.	CONCENTRATES. Analyses. Phosphorus. Per Cent.	TAILINGS. Weight and Per Cent. Pounds.	TAILINGS. Weight and Per Cent. Per Cent.	TAILINGS. Analyses. Iron. Per Cent.	TAILINGS. Analyses. Magnetite. Per Cent.	TAILINGS. Analyses. Insoluble. Per Cent.	TAILINGS. Analyses. Sulphur. Per Cent.	TAILINGS. Analyses. Phosphorus. Per Cent.	DUST LOSS. Pounds.	DUST LOSS. Per Cent.	EFFICIENCY. Per Cent. of Mag- netite Recovered.	EFFICIENCY. Per Cent. of Mag- netite Lost.	EFFICIENCY. Tons of Crude per Ton of Concentrate.
1	20	114	10.80	34.34	44.04	52.46	.....	524	16.7	46.53	57.04	52.88	Trace	0.053	348	68.1	9.23	11.77	.....	75	1.6	33.70	16.00	9.14
2	56	234	8.89	37.19	51.50	40.84	.....	1.81	48.5	63.80	74.97	58.10	Trace	0.050	68	29.3	10.05	12.90	.....	4	2.2	44.69	15.11	1.71
3	72	724	18.89	38.39	53.77	44.81	.....	946	61.1	52.51	73.56	58.09	Trace	0.045	770	46.7	45.01	30.85	.....	8	1.5	58.35	14.63	1.61
4	8	984	35.09	40.98	57.78	47.47	.....	618	46.2	50.87	71.17	59.78	Trace	0.055	135	12.7	45.60	30.95	.....	6	1.1	57.56	17.48	1.31
5	6	1,155	39.69	37.66	51.95	44.48	.....	749	81.1	60.84	74.26	65.55	Trace	0.051	404	34.9	44.16	19.84	.....	11	0.8	64.97	15.26	1.86
Totals		2,707	100.00	38.85	53.98	47.16	.....	2,395	59.0	59.06	71.56	57.8	Trace	0.050	1,402	37.6	43.16	18.18	.....	67	1.6	56.65	15.85	1.641

RECAPITULATION :

Pounds Magnetite in Crude	1054.82	Per Cent. Saved in Concentrate	81.378
" " Concentrate	1441.16	" Lost in Tailings	15.426
" " Tailings	866.79	" Lost in Dust	3.196
" Dust	19.16	Total	100.000
Total	1054.81		

WET CONCENTRATION.

Sample Number.	Ground to Mesh.	Weight in Pounds.	CRUDE ORE. Analyses. Per Cent. Iron.	CRUDE ORE. Analyses. Per Cent. Magnetite.	CRUDE ORE. Analyses. Per Cent. Insoluble.	CRUDE ORE. Analyses. Per Cent. Sulphur.	CRUDE ORE. Analyses. Per Cent. Phosphorus.	CONCENTRATES. Weight and Per Cent. Pounds.	CONCENTRATES. Weight and Per Cent. Per Cent.	CONCENTRATES. Analyses. Per Cent. Iron.	CONCENTRATES. Analyses. Per Cent. Magnetite.	CONCENTRATES. Analyses. Per Cent. Insoluble.	CONCENTRATES. Analyses. Per Cent. Sulphur.	CONCENTRATES. Analyses. Per Cent. Phosphorus.	TAILINGS. Weight and Per Cent. Pounds.	TAILINGS. Weight and Per Cent. Per Cent.	TAILINGS. Analyses. Per Cent. Iron.	TAILINGS. Analyses. Per Cent. Magnetite.	TAILINGS. Analyses. Per Cent. Insoluble.	SLIME LOSS. Pounds.	SLIME LOSS. Per Cent.	FIFTH DUTY. Per Cent. of Mag- netite Recovered.	FIFTH DUTY. Per Cent. of Mag- netite Lost.	FIFTH DUTY. Tons of Crude per Ton of Concentrate.
1	20	1008	37.34	81.14	47.36	0.063	0.023	356	35.15	64.00	74.33	53.82	Trace	.....	646	64.05	37.55	25.77	Trace	.....	6	0.6	96.78	3.22	1.80
2	10	965	37.66	81.14	47.36	0.063	0.052	.....	.....	65.46	76.54	52.77	Trace	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	60	.....	35.16	76.66	52.72	Trace	0.050	.....	.....	68.81	83.67	47.65	Trace	0.048	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4*	100	.....	29.27	62.97	58.42	Trace	0.045	754	49.4	61.72	75.14	3.73	Trace	0.042	1.2	0.1	46.8	10.71	11.83	.....	8*	0.8	89.12	10.88	2.07

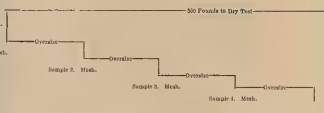
RECAPITULATION FOR SAMPLE No. 2—20*

Pounds Magnetite in Crude	868.719	Per Cent. Saved in Concentrate	81.819
" " Concentrate	488.754	" Lost in Tailings	8.279
" " Tailings	294.855	" Lost in Slimes	4.464
" Slimes	6.540	Total	100.000
Total	790.149		

Mill Log of Test No. 2, on Moose Mountain Crude.

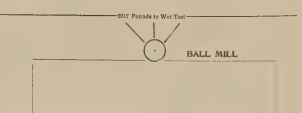
Weight of Sample Received 3,117 Pounds; broken in Blake Crusher to 1 inch, thence to Cornish Rolls crushing to 1-6 inch.

Sampled (A.)



Analysis of Sample A.

	Iron.	Magnetite.	Insoluble.	Sulphur.	Phosphorus.	Titanium.
Per Cent.	35.68	49.36	90.38	0.022	0.010	0.00



DRY CONCENTRATION.

Sample Number.	Through Mesh.	CRUDE ORE. Pounds.	CRUDE ORE. Analyses. Per Cent. Iron.	Per Cent. Magnetite.	Per Cent. Insoluble.	Per Cent. Sulphur.	CONCENTRATES. Pounds.	CONCENTRATES. Analyses. Per Cent. Iron.	Per Cent. Magnetite.	Per Cent. Insoluble.	Per Cent. Sulphur.	Per Cent. Phosphorus.	TAILINGS. Pounds.	TAILINGS. Analyses. Per Cent. Iron.	Per Cent. Magnetite.	Per Cent. Insoluble.	Per Cent. Sulphur.	Per Cent. Phosphorus.	DUST LOSS. Pounds.	EFFICIENCY. Per Cent. of Magnetite Saved.	Per Cent. of Mag. Saved Plus Per Cent. of Iron in Tailings.
4	20	350	35.68	49.36	90.38	0.022	197	65.6	91.46	79.95	39.39	0.03	0.03	90	20.0	3.53	7.65		12	4.3	24.78	5.33	1.82
5	40																				
6	60																				
7	100																				
Totals		350	35.68	49.36	90.38	0.022	197	65.6	91.46	79.95	39.39	0.03	0.03	90	20.0	3.53	7.65		12	4.3	24.78	5.33	1.82

RECAPITULATION:

Pounds Magnetite in Grade..... 197.78
" " Concentrate..... 180.81
" " Tailings..... 6.86
" " Dust..... 1.19
Total..... 197.78

Per Cent. Saved in Concentrate 91.46
" Lost in Tailings..... 4.87
" Lost in Dust..... 3.67
Total..... 100.00

WET CONCENTRATION.

Sample Number.	Passed to Mesh.	Weight in Pounds.	CRUDE ORE. Analyses. Per Cent. Iron.	Per Cent. Magnetite.	Per Cent. Insoluble.	Per Cent. Sulphur.	Per Cent. Phosphorus.	CONCENTRATES. Weight and Per Cent. Pounds.	Per Cent.	CONCENTRATES. Analyses. Per Cent. Iron.	Per Cent. Magnetite.	Per Cent. Insoluble.	Per Cent. Sulphur.	Per Cent. Phosphorus.	TAILINGS. Weight and Per Cent. Pounds.	Per Cent.	TAILINGS. Analyses. Per Cent. Iron.	Per Cent. Magnetite.	Per Cent. Insoluble.	Per Cent. Sulphur.	Per Cent. Phosphorus.	SLIME LOSS. Pounds.	EFFICIENCY. Per Cent. of Magnetite Saved.	Per Cent. of Mag. Saved Plus Per Cent. of Iron in Tailings.
1	30	531	35.68	49.36	90.38	0.022	0.010	457	71.8	46.44	64.24	32.89	0.01	0.01	203	31.8	7.91	10.96				71	6.5	94.55	2.45	1.28
2	40	280	35.68	49.36	90.38	0.022	0.010	671	67.6	49.13	67.97	30.46	0.02	0.01	325	32.3	7.91	10.96				76	9.3	97.07	2.93	1.18
3	60	926	35.68	49.36	90.38	0.022	0.010			50.05	73.35	31.89	0.01	0.01			5.90	9.38								
4	100		35.68	49.36	90.38	0.022	0.010	490	53.7	51.61	68.32	9.09	0.03	0.009	371	29.1	5.90	9.38				105	16.3	91.95	3.05	1.97

RECAPITULATION FOR SAMPLE No. 1--2":

Pounds Magnetite in Grade..... 472.504
" " Concentrate..... 422.406
" " Tailings..... 39.026
" " Slimes..... 9.761
Total..... 470.193

Per Cent. Saved in Concentrate 91.397
" Lost in Tailings..... 8.414
" Lost in Slimes..... 1.732
Total..... 100.000

SIEVE TEST ON COE HILL DRY CONCENTRATES,

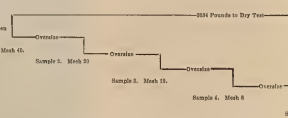
Showing Distribution of Material according to Mesh Size.

Concentrates from Screen—	Weight, Pounds.	Per Cent. Pass. 200 Mesh.	Per Cent. Pass. 60 Mesh.	Per Cent. Pass. 40 Mesh.	Per Cent. Pass. 20 Mesh.	Per Cent. Pass. 10 Mesh.	Per Cent. Pass. 10 Mesh.
1	835	41.15	15.61	9.88	26.96	.....	.....
2	303	9.55	4.16	3.11	21.62	67.70	.....
3	319	10.13	4.69	3.15	29.41	52.39	98.85
4	347	6.76	3.13	2.05	8.36	25.55	85.45	97.20
5	1,380	8.39	2.53	1.94	4.58	17.65	54.61	69.51
Total Averages..	3,397	16.03	6.79	4.61	16.67	36.28	59.50	84.60

Mill Log of Test No. 3, on Coe Hill Crude.

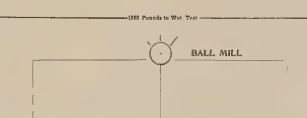
Weight of Sample Received 5602 Pounds; broken in Blake Crusher to 1 inch, thence to Cornish Rolls crushing to 1-4 inch.

Sampled (A.)



Analysis of Sample A.

	Iron.	Magnetite.	Insoluble.	Sulphur.	Phosphorus.	Titanium.
Per Cent.	63.70	46.46	28.18	1.71	0.08	0.00



DRY CONCENTRATION.

Sample Number.	Through Mesh.	CRUDE ORE. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur Per Cent.	CONCENTRATES. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur Per Cent.	Phosphorus Per Cent.	TAILINGS. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur Per Cent.	DUST LOSS. Pounds.	Per Cent.	EFFICIENCY. Per Cent. of Magnetic Iron Saved.	Per Cent. of Magnetic Iron Lost.	Value of Concentrates Per Ton of Crude.
1	45	1,166	46.05	47.09	61.34	27.36	2.21	655	25.8	61.80	60.30	3.72	0.41	0.033	294	11.5	5.44	2.89	1.75	84	3.1	96.61	1.41	1.57
2	10	233	9.55	54.26	71.77	20.35	1.46	203	8.0	64.40	63.07	7.66	1.79	0.094	42	12.3	5.45	4.59	3.16	7	2.3	93.56	0.84	1.19
3	20	255	9.89	55.09	73.48	19.70	1.75	219	27.5	61.85	59.30	9.66	1.46	0.094	58	10.7	5.61	5.76	3.63	8	1.7	93.78	0.82	1.16
4	3	203	10.84	54.46	71.49	21.00	1.74	247	29.3	60.73	59.91	11.79	1.51	0.092	43	10.7	11.61	7.93	4.90	4	1.3	96.33	1.62	1.13
5	4	1,478	49.51	54.83	71.10	21.78	2.02	1,160	37.0	60.18	59.81	11.65	1.37	0.095	168	12.4	10.88	7.50	3.69	9	0.8	96.66	1.64	1.15
Totals.....		3,134	100.00	53.84	69.80	23.61	1.98	2,527	83.6	61.83	60.30	10.61	1.35	0.098	537	14.8	7.39	4.31	2.64	60	1.6	93.18	0.87	1.167

RECAPITULATION:

Pounds Magnetite in Crude.....			2,216.26.
" "	Concentrate.....	2,159.46	
" "	Tailings.....	52.51	
" "	Dust.....	10.31	
Total.....			2,201.28

Per Cent. Saved in Concentrate.....	96.234
" Lost in Tailings.....	0.053
" Lost in Dust.....	0.701
Total.....	100.905

WET CONCENTRATION.

Sample Number.	Through Mesh.	Ground to Mesh.	Weight in Pounds.	CRUDE ORE. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur Per Cent.	Phosphorus Per Cent.	CONCENTRATES. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur Per Cent.	Phosphorus Per Cent.	TAILINGS. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	SLIME LOSS. Pounds.	Per Cent.	EFFICIENCY. Per Cent. of Magnetic Iron Saved.	Per Cent. of Magnetic Iron Lost.	Value of Concentrates Per Ton of Crude.
4	50	1,200	1,204	52.20	68.40	22.16	1.71	0.03	774	27.1	61.82	55.37	8.68	1.64	Trace	187	48.6	7.73	10.13	2.06	42	1.2	94.51	1.46	1.297
5	10	240	924	52.20	68.40	22.16	1.71	0.03	744	26.2	63.67	54.47	9.49	1.84	Trace	175	48.5	11.65	10.97	1.97	5	1.6	94.84	1.16	1.321

RECAPITULATION FOR SAMPLE No. 1:

Pounds Magnetite in Crude.....			957.57
" "	Concentrate.....	893.249	
" "	Tailings.....	59.284	
" "	Slimes.....	4.886	
Total.....			957.397

Per Cent. Saved in Concentrate.....	93.309
" Lost in Tailings.....	5.810
" Lost in Slimes.....	0.478
Total.....	100.000

SIEVE TEST ON CALABOGIE DRY CONCENTRATES.

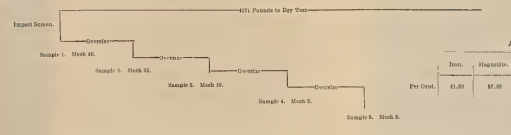
Showing Distribution of Material According to Mesh Size.

Concentrates from Sample.	Weight, Pounds.	Per Cent Pass. 100 Mesh.	Per Cent. Pass. 65 Mesh.	Per Cent. Pass. 48 Mesh.	Per Cent. Pass. 35 Mesh.	Per Cent. Pass. 28 Mesh.	Per Cent. Pass. 10 Mesh.	Per Cent. Pass. 8 Mesh.
1	711	60.40	19.79	6.55	33.15	.....	.....	.....
2	995	15.11	6.35	3.11	15.82	61.50	.....	.....
3	990	11.25	5.60	3.18	3.48	46.00	36.52	.....
4	953	11.80	4.60	2.69	2.75	34.55	25.85	5.26
5	995	17.38	4.80	2.79	2.43	26.14	20.56	3.79
Total Average...	3,753	19.84	8.75	3.78	15.70	27.83	20.49	3.31

Mill Log of Test No. 4, on Calabogie Crude.

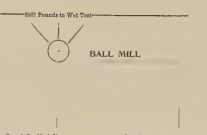
Weight of Sample Received 6280 Pounds; Broken in Blake Crusher to 1 Inch, thence to Cornish Rolls Crushing to 1-6th Inch.

Sampled (A.)



Analysis of Sample A.

	Iron.	Magnetic.	Insoluble.	Sulphur.	Phosphorus	Titanium.
Per Cent.	61.69	87.00	35.18	0.039	0.37	0.09



DRY CONCENTRATION.

Sample Numbers.	Through Mesh.	CRUDE ORE. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	CONCENTRATES. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	TAILINGS. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	DUST LOSS. Pounds.	Per Cent.	EFFICIENCY. Per Cent of Magnetic Iron.	Per Cent of Crude Per Cent of Iron.
1	40	1,351	34.76	57.57	51.41	39.10	0.156	0.11	711	51.8	61.37	48.64	3.53	Trace	0.08	544	40.4	52.79	4.06	1.9	45	3.4	56.94	4.06	1.9	.....
2	76	995	7.26	44.86	41.76	19.36	0.126	0.05	995	69.3	65.3	66.66	3.25	Trace	0.09	95	6.6	52.9	5.87	7.89	45	4.7	66.39	3.69	1.46	.....
3	32	432	9.36	45.37	43.59	24.80	0.063	0.09	990	70.4	67.42	68.77	2.88	Trace	0.10	184	13.1	55.45	7.47	12.08	14	1.16	73.58	4.79	1.12	.....
4	8	1,581	58.19	48.83	62.84	21.66	0.06	0.09	953	70.5	61.66	64.92	3.64	Trace	0.11	393	29.08	7.86	10.55	.....	41	3.02	26.33	4.98	1.43	.....
5	9	980	16.36	46.33	63.24	20.66	0.027	0.05	995	71.4	60.06	66.85	2.56	Trace	0.11	389	28.3	7.56	11.09	.....	39	2.79	26.33	4.58	1.32	.....
Total		4,171	100.00	43.06	59.26	23.54	0.090	0.069	3,753	64.19	63.06	66.78	3.43	Trace	0.098	1,567	29.55	5.66	6.29	.....	181	3.30	65.39	4.71	1.516	.....

RECAPITULATION:

Pounds Magnetic in Crude.....2438.54

" " Concentrate.....2502.4

" " Tailings.....201.8

" " Dust.....14.14

Total.....2670.34

Per Cent. Saved in Concentrate..... 25.348

" Lost in Tailings 1.113

" Lost in Dust 0.951

Total 109.004

WET CONCENTRATION.

Sample Numbers.	Ground in Mesh.	Weight in Pounds.	CRUDE ORE. Weight and Per Cent.	Analyses. Iron. Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	CONCENTRATES. Weight and Per Cent.	Analyses. Iron. Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	TAILINGS. Weight and Per Cent.	Analyses. Iron. Per Cent.	Magnetic Per Cent.	Insoluble Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	SLIME LOSS. Pounds.	Per Cent.	EFFICIENCY. Per Cent. of Magnetic Iron.	Per Cent. of Crude Per Cent. of Iron.
1	40	1,351	623	61.69	47.05	35.18	0.12	0.37	437	64.9	67.55	78.14	41.17	Trace	0.31	241	36.0	47.76	15.86	.....	45	3.4	85.66	92.34	1.74
2	76	995	689	61.69	57.66	25.18	0.138	0.17	689	67.9	64.66	68.64	2.37	Trace	0.04	241	24.2	8.64	11.99	.....	45	7.6	82.76	7.24	1.3
3	32	432	184	61.69	57.66	25.18	0.138	0.17	168	69.69	69.84	80.73	7.64	Trace	0.04	257	59.9	4.64	5.57	.....	27	6.06	96.43	3.57	1.0

RECAPITULATION FOR SAMPLE No. 1

Pounds Magnetic in Crude.....

" " Concentrate .....

" " Tailings .....

" " Slimes .....

Total.....

Per Cent. Saved in Concentrate..... 86.349

" Lost in Tailings..... 9.930

" Lost in Slimes..... 1.005

Total..... 100.000

SIEVE TEST ON RADNOR DRY CONCENTRATES

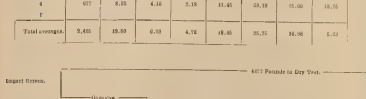
Showing Distribution of Material According to Mesh Size.

Concentrates from sample.	Weight. Pounds.	Per Cent. Pass. 100 Mesh.	Per Cent. Pass. 80 Mesh.	Per Cent. Pass. 60 Mesh.	Per Cent. Pass. 40 Mesh.	Per Cent. Pass. 20 Mesh.	Per Cent. Pass. 10 Mesh.	Per Cent. over 10 Mesh.
1	645	33.92	16.66	11.43	41.44	.....	.....	.....
2	1247	9.68	1.56	1.02	9.34	38.50	.....	.....
3	754	8.55	2.12	2.12	9.34	40.95	20.30	.....
4	677	8.55	4.16	2.16	11.45	29.19	15.00	19.75
5								
Total averages.	2,435	19.60	6.39	4.74	16.46	35.75	16.96	5.60

Mill Log of Test No. 5, on Radnor Crude.

Weight of Sample Received 6397 Pounds, Broken in Blake Crusher to 1 inch, thence to Cornish Rolls Crushing to 1-6th inch.

Sampled (A.)



Analysis of Sample A.

	Iron.	Magnetite.	Insoluble.	Sulphur.	Phosphorus.	Titanium.
Per Cent.	46.88	59.84	20.55	0.171	0.172	0.30



DRY CONCENTRATION.

Sample Number.	Through Mesh.	CRUDE ORE. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Iron. Per Cent.	Insoluble. Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	CONCENTRATES. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Iron. Per Cent.	Insoluble. Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	TAILINGS. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Iron. Per Cent.	Insoluble. Per Cent.	Sulphur. Per Cent.	Phosphorus Per Cent.	DUST LOSS. Pounds.	Per Cent.	EFFICIENCY. Per Cent. of Mag. Iron Saved.	Per Cent. of Mag. Iron Lost.	Value of Crude per Ton.
1	10	645	26.55	34.51	33.36	21.84	0.070	0.05	330	14.1	4.26	0.16	0.05	15	63.5	84.6	7.31	1.87								
2	60	1247	51.30	47.97	46.40	35.43	0.150	0.08	320	13.5	3.05	1.05	0.05	11	2.7	91.57	7.32	1.74								
3	10	754	31.15	43.67	46.09	31.59	0.170	0.14	481	19.1	5.67	12.31	0.07	19	1.1	93.16	7.91	1.66								
4	8	1,170	27.58	41.95	25.77	32.44	0.275	027	47.4	45.99	20.18	8.00	0.60	Trace	468	18.8	3.45	16.09	0.36	10	0.8	92.16	8.50	1.74		
Totals	.....	4,023	100.00	41.32	47.66	37.18	0.198	0.145	66.76	67.46	66.32	5.86	0.068	Trace	1,293	41.34	7.76	16.07	0.046	55	1.39	91.77	0.83	1.701		

RECAPITULATION:

Pounds Magnetite in Crude	3401.672
" " Concentrates	3267.455
" " Tailings	101.391
" " Dust	11.826
Total	3480.672

Per Cent. Saved in Concentrate	91.769
" " Lost in Tailings	7.799
" " Lost in Dust	.346
Total	100.000

WET CONCENTRATION.

Sample Number.	Through or Over Mesh.	CRUDE ORE. Weight in Pounds.	Analyses. Iron. Per Cent.	Magnetic Iron. Per Cent.	Insoluble. Per Cent.	Sulphur. Per Cent.	Phosphorus. Per Cent.	CONCENTRATES. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Iron. Per Cent.	Insoluble. Per Cent.	Sulphur. Per Cent.	Phosphorus. Per Cent.	TAILINGS. Weight and Per Cent. Pounds.	Per Cent.	Analyses. Iron. Per Cent.	Magnetic Iron. Per Cent.	SLIME LOSS. Pounds.	Per Cent.	EFFICIENCY. Per Cent. of Mag. Iron Saved.	Per Cent. of Mag. Iron Lost.	Value of Crude per Ton.
1	10	645	46.88	59.84	20.55	0.171	0.172	382	37.49	66.78	62.12	0.46	0.09	0.087	593	57.46	5.9	1.76	57	5.5	94.31	5.70	1.74
2	60	648	46.88	59.84	20.55	0.171	0.172	278	15.8	68.81	64.39	0.36	0.04	0.038	591	33.4	5.45	1.76	43	2.4	94.42	5.58	1.74
3	60	787	46.88	59.84	20.55	0.171	0.172	417	48.6	69.39	65.55	2.49	0.02	0.030	330	39.4	5.84	7.15	40	12	89.34	6.66	1.82

RECAPITULATION FOR SAMPLE No. 3.

Pounds Magnetite in Crude	459.484
" " Concentrate	456.164
" " Tailings	52.650
" " Slimes	4.810
Total	459.484

Per Cent. Saved in Concentrate	93.987
" " Lost in Tailings	5.757
" " Lost in Slimes	0.256
Total	100.000

LAKE SAVANT IRON RANGE AREA

BY E. S. MOORE

Introduction

The Lake Savant Iron Range seems to be a fitting term to apply to that range which extends more or less continuously for a considerable distance westward from the lower part of Lake Savant. The range is discontinuous in some places, but it can be traced by small outcrops and by deflections of the magnetic needle for a distance of about 25 miles, beginning on the islands near the western shore of Savant lake and reaching just beyond the southern end of Cliff lake.

A geological survey of the iron range and the surrounding area was made by the writer during the past summer while acting under the instructions of Mr. T. W. Gibson, Deputy Minister of Mines, and a map on a scale of two miles to an inch has been prepared to accompany this report. While in the field and also during the preparation of this report the "Map of the Routes Traversed by the National Transcontinental Railway between Lake Nipigon and Sturgeon Lake," prepared by Mr. W. H. Collins and published by the Canadian Geological Survey, has been found of very great service. Although more detailed work necessitated changes, the geological features and topography were found very accurately represented, considering the conditions under which the map had been prepared. The blue-prints of the trial lines run by the Grand Trunk Pacific Railway Company between lake Savant and Cliff lake, and later abandoned, have been obtained through the kindness of the chief engineer at Ottawa, and have been very useful in furnishing data for the accompanying map.

For many favors and much assistance in carrying on the work in the field, the writer is indebted to Messrs. Flaherty and Morgan, of Port Arthur, and to the several prospectors met in the Savant region. Mr. F. M. Handy acted as field assistant during this season and performed the greater portion of the topographic work.

History of the Iron Range

Although Prof. W. G. Miller[1] as early as the year 1903 mentions the occurrence of magnetite on the shore and islands of lake Savant, and also the probability that a typical iron range would be found farther west, it was not until about the year 1906 that the main range was staked. In the latter year Mr. W. H. Collins made a reconnaissance trip through the lake Savant region and wrote a brief account of the iron formation.[2]

Some development work in the form of shaft sinking, test-pitting and stripping has been performed, but no diamond drilling has been done, nor has any attempt at mining been made, as "pay ore" has not been located.

During last summer five men were employed in doing assessment work on the claims along the south side of lake Kashaweogama, where the main range reaches its greatest width, and several prospectors were locating claims on other portions of the range. At that time no staking had been done on the range just south of Iron lake, where it is wider than in many other places which have been staked. Some claims have been staked between Grebe and Pickerel lakes on an insignificant outcrop of iron formation, and others on small outcrops near Cliff lake.

The building of the Transcontinental railway will have a great influence in opening up this and surrounding areas, by permitting more satisfactory work upon the range already staked and increasing the chances of making further discoveries.

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[1] W. G. Miller, 12th Rep. Bur. Min., 1903, p. 313. [2] W. H. Collins, Summary Rep. Can. Geol. Surv., 1906, p. 103.

Geography

Position and Extent of the Area

The area included in the accompanying map lies in unsurveyed territory. It is situated in latitude between parallels 50 deg. 30 min. and 50 deg. 15 min., and in longitude between meridians 90 deg. 25 min. and 91 deg. 25 min. It is about 45 miles in maximum length by 12 miles in maximum width, and lies with its long axis nearly east and west. Extending along the central portion of the area there is a chain of lakes beginning with lake Savant on the east and ending with lake Kimmewin on the west, which lakes, with the connecting streams form an excellent canoe route.

The iron range area may be approached by various routes, and a description of these may prove of value to travellers. The easiest and most desirable route to follow is that by way of Superior Junction, the point where the Lake Superior Branch of the G.T.P. railway meets the main line of the Transcontinental. This village is situated on the



Fig. 1. Scene on Sturgeon river above Superior junction.

Sturgeon river, about 11 miles below Dog Lake portage. The river is large, the current almost negligible, and the portage to Dog lake is short, as, indeed, are all the portages on the route. Dog river, above the lake of the same name, is a good stream for navigation by canoe, as the current is not at all troublesome. There are between Superior Junction and lake Kashaweogama only nine portages, the longest, that into Dog lake, being less than half a mile, while the others are less than ten chains in length.

There is, at the time of writing, railway connection with Sturgeon lake, from which two routes lead to Kashaweogama. One runs from Trapper's Cabin at the northern limit of North Bay, a point reached by steamer, and the other leaves Northeast Bay at a point also reached by steamers. When the Transcontinental railway is complete the route from Trapper's Cabin will be greatly improved, as the first portage of about 3½ miles now in existence will be almost eliminated. At the time our excursion was made it was possible to have goods transported by waggon from Trapper's Cabin, 3½ miles, to lake Chivelston. From the latter lake a portage about five-eighths of a mile long leads to Harris lake, from which a portage of three-eighths of a mile leads to another lake to the north. From the latter lake the best route is one with good portages leading through lakes Handy, Pickerel and Grebe to Kashaweogama. Another route runs from the above-

mentioned lake by a portage three-quarters of a mile long to lake Savant, whence two routes to Kashaweogama may be followed, one by way of Grebe and the other by way of Iron lake.

Rocks Between Westfort and Superior Junction

As one leaves Westfort on the new G.T.P. railway he observes very little rock, except glacial drift, on which are located a number of farms, until Duna is reached, about twenty miles from Westfort. At this point there occurs an interesting green schist, apparently of Keewatin age, and containing a large number of quartz veins, chiefly as small stringers. None of these, however, appear to be mineralized. This type of rock continues to near the station called Griff, where Laurentian granite and gneiss appear and extend a long distance northwest, just how far was not determined, as darkness prevented observations.



Fig 2. Falls at outlet of Island Lake.

The Height of Land is crossed near Dexter, about 50 miles from Westfort, and the Laurentian area is characterized by immense swamps and muskegs lying between low hills of drifts or knolls of granite and gneiss. In this area occurs a portion of the bog iron district described in the last report of the Bureau of Mines.

Around Superior Junction Keewatin rocks are exposed, and just behind the railway station there is a mass of volcanic agglomerate resembling conglomerate in some respects, but differing from it in that the majority of the fragments are angular and unassorted, and further, in that the fragments consist almost exclusively of rhyolite.

From Superior Junction to Dog lake the rock on the southeast side of the Sturgeon river consists almost entirely of quartz-porphyry, while green schist and some tufaceous rocks occur along the opposite bank. There are no glacial lake beaches in this area.

Soil and Forests

The soil of the area explored is similar to that which is found over the greater portion of the rocky districts of northern Ontario. There is probably less distinctly sandy soil than in many other areas, because of the absence of the sandy, shallow water deposits of the great glacial lakes which covered large areas in the Nipigon and other regions.

The forests are similar to those so often described in other northern districts, and consist chiefly of spruce, balsam, tamarac, poplar, cedar, jack-pine and birch. There are some areas of jack-pine and spruce which will be valuable as timber lands, but on the whole the timber is small and short. A few red and white pine were seen. A number of red pine trees occur on the Sturgeon river above Superior Junction, and a few red ones and a white one as far north as the north bay of Island lake (Fig. 3). The fires have

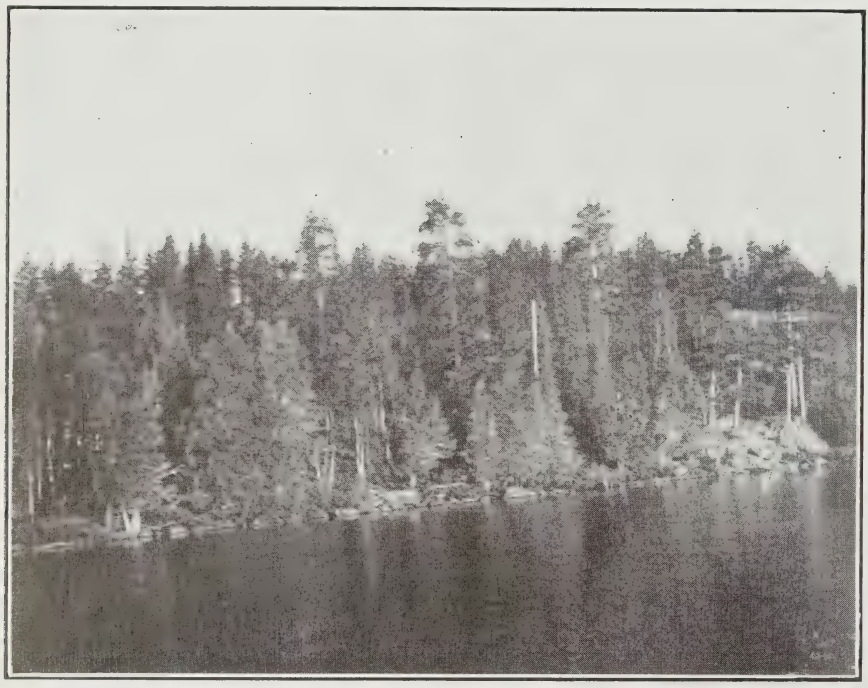


Fig. 3. Red and white pine on Island in the North Bay of Island Lake.

not yet devastated as much of this area as of so many farther east and south, and it is only in a few places, such as on the small lakes above lake Kimmewin, on Island lake, and on part of lake Kashaweogama, that much of the timber has been destroyed.

Fish and Game

The only fish taken by our party were pike, pickerel and suckers. A number of the lakes contain an abundance of pickerel (Fig. 4), and lake trout are said to be abundant in lake Savant. There are many beavers, otters and bears; and game in the form of partridges, rabbits, moose and caribou is plentiful. Seven moose were seen during the first two weeks spent in the field.

Surveys

No survey lines have been run in the area mapped except the trial lines of the G.T.P. railway, which were later abandoned. These lines have been placed on the map, and they have proved very serviceable in forming a base to which the micrometer and compass surveys made last summer could be attached.

In gathering the data for the accompanying map a track survey was made of the lower part of Cliff lake, of Pickerel, Handy and other small lakes, and a micrometer and dial compass survey of lakes Iron and Kashaweogama, while much of the other topographic data was obtained directly from W. H. Collins' map, already mentioned[3] although in many cases minor changes have been made in it.

Topography

There is a certain uniformity about the topography of this area, as there is about many other portions of the peneplain covering northern Ontario. The greater part lies



Fig. 4. One hour's catch of pickerel with troll in Island Lake.

at an altitude of about 1,300 feet, and few of the hills rise more than one hundred or even fifty feet above the general level of the region, though rarely, as west of Iron lake, they may be as much as 200 feet in height.

The immense number of lakes with intricate outlines is a striking feature. The strike and nature of the containing rock have a great influence on the form of the lakes. In schist they usually occur as long narrow bodies lying parallel to the strike of the schist, with here and there constricted portions cutting across the strike of the schist nearly at right angles. Lake Kashaweogama and Island lake lie mostly in schist or conglomerate, and follow the strike of the rocks pretty closely. The long bay on the south of Island

[3] Can. Geol. Surv., 1906; map No. 993; compiled by W. H. Collins.

lake and the southern extension of Iron lake bear in their form and their relation to the surrounding rocks somewhat the appearance of having served as pre-glacial river channels. Cliff, Grebe and Curlew are good examples of lakes contained by granite or gneiss shores, and with their numerous irregular bays exhibit a much more intricate outline than do the lakes in the schist, as the long axes of these bays lie in all directions. These numerous lakes, some of which are of large size, furnish the area with first-class facilities for travel by canoe. Lake Savant is about 23 miles in its greatest dimension, and Cliff lake, though not much explored, is about 15 miles. The latter lake probably gets its name from the numerous steep cliffs along its shores. Lake Savant is characterized by numerous islands and many large bays, most of which are comparatively shallow. It has the character of a lake formed by the damming of a pre-glacial water course by glacial drift.

Many large swamps occur, such as those west of the southern end of Cliff lake and north and south of Island lake and lake Kashaweogama. The swamps, which lie on ground moraine, occasionally extend over two miles and break the continuity of the rock formations. In most cases there are scattered over them numerous drumlin-like knolls of drift, and in places the ground moraine grades into eskres and limited terminal moraine. One of these terminal moraines, about 85 feet in height, completely buries from view the iron range just south of the eastern end of lake Kashaweogama.

Geology

Historical Geology

The following classification may be applied to the rocks of the lake Savant area:

	Pleistocene: Drift.
Pre-Cambrian	Keweenawan: Diabase.
	Lower Huronian: Conglomerate, a little arkose and greywacké, and probably a few small patches of quartzite.
	Laurentian: Granite and gneiss.
	Keewatin: Banded Iron formation, greywacké and fine-grained grey gneiss, rhyolites, quartz-porphyries, tuffs, greenstones and green schists.

When the rocks are compared with those of other Keewatin areas with which the writer is familiar farther east in Canada, there are a few striking differences. The most noticeable are the great amount of greywacké occurring in the Keewatin, and the presence of considerable amounts of a fine-grained, grey, biotite gneiss, which appears to correspond closely with the gneisses described as Couchiching by Lawson. It would appear that this type of gneiss is probably more widely distributed in the regions lying in the vicinity of Lake of the Woods than in the regions farther east. In the field it is hard to classify much of the gneiss as a meta-igneous or meta-sedimentary rock, but a study of thin sections shows that the specimens which could not always be separated in the field may have been obtained from an altered igneous rock in one case, and an altered sediment in another. The igneous rocks giving rise to the gneisses are usually rhyolites or quartz-porphyries, and the sediment has the appearance of having been derived by the alteration of similar rocks. The greywackés have a composition such as to suggest that their origin was from rather basic rocks, and it seems probable that these gneisses may have been developed by the disintegration and partial decomposition of the more acid rocks which form a considerable portion of the complex Keewatin series.

In places these sediments appear to grade gradually over into distinct igneous rocks in the form of quartz-porphyries and rhyolites, and altogether the great quantity of partially decomposed material in the form of greywackés and gneisses suggests the possibility of much sub-aerial rock decay in Keewatin time. That both the greywacké and the above-mentioned gneiss are older than the conglomerate, which shows every evidence of being the basal conglomerate of the Lower Huronian, seems to be affirmed by the numerous pebbles of both of these rocks in the conglomerate, by the inter-banding of

these rocks with the Iron formation, fragments of which are also included in the conglomerate, and by the intrusion of both of these rocks by the Laurentian granite. The presence of so much greywacké with the Iron formation and the absence of Iron formation pebbles in large areas of the conglomerate, at first led the writer to regard the Iron formation as of Huronian age, and he believes that Mr. W. H. Collins has entertained the same view as a result of his field work in the region,[4] but the finding later of large numbers of Iron formation fragments in the conglomerate, as well as other considerations, seemed to establish definitely the greater age of the Iron formation and greywacké.

The typical extrusive Keewatin greenstone is almost lacking except in the eastern portion of the area, where a considerable portion of the south end of lake Savant is bounded by it. The Laurentian system is well developed in this area, the greater portion being covered with granite and gneiss. There seems to be a possibility that all the granite mapped as Laurentian may not be of that age, but that some of it is of an unknown age, younger than Laurentian. The evidence for regarding some of the granite

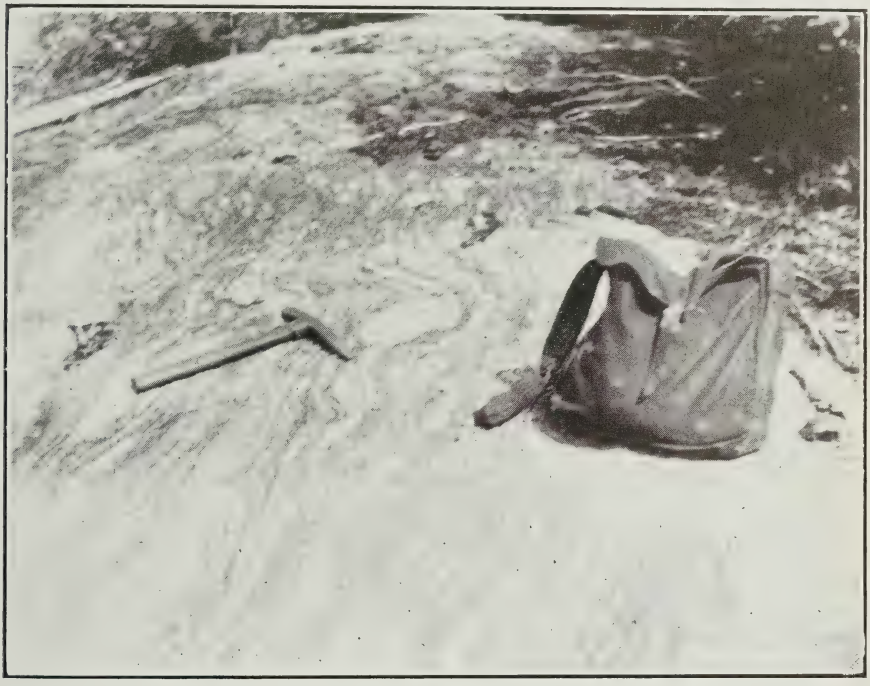


Fig. 5. Lower Huronian conglomerate on Dog river.

as younger is found in the much less metamorphosed condition of considerable areas, the overlying of distinctly gneissic masses by comparatively little metamorphosed masses, and the cutting of portions of the gneiss by dikes. The first of these factors cannot be regarded as proof of the younger age, and the dikes were only seen in one place on Cliff lake. The frequent occurrences of dikes, of the nature of pegmatites, in the Laurentian granite of many districts, makes the evidence of the last two factors unreliable as definite evidence. It would, however, be interesting, should further and more detailed work ever be carried on in the vicinity of Cliff lake, to endeavor to establish the ages of two series of granites in that area.

[4] Report on a Portion of Northwestern Ontario Traversed by the National Transcontinental Railway between Lake Nipigon and Sturgeon Lake, by W. H. Collins, Canadian Department of Mines, Ottawa, 1908.

There are in parts of the area, chiefly around Island lake, numerous quartz veins which in places are mineralized, but we did not succeed in panning gold from any of them. One of the veins near the outlet of Island lake is about five feet in width, and can be traced for about 100 feet before it passes under the lake. From the fact that the quartz veins are closely connected with the contact between the Laurentian and Keewatin, and as far as observed are not found in the Huronian, their age would appear to be about that of the Laurentian granite. Observations in the Sturgeon lake region to the south, where similar veins occur, have also led the writer to regard them as being about Laurentian in age.

The Huronian conglomerate occurs here in an unusually long and continuous band over 30 miles in length. It is made up chiefly of large and well-rounded granite pebbles, which often, though not always, show extensive water action. Many of the pebbles have been drawn out into lenses by excessive metamorphic processes. (Fig. 5.)

The conglomerate in places grades over into an arkose and greywacké, and it is often difficult, unless this relation can be traced out, to distinguish between some of the areas of Keewatin and Huronian graywacké. A few small patches of impure quartzite south of lake Kashaweogama are probably of Huronian age. The relations between the conglomerate and Laurentian granite are interesting, and will be described in the section on the Huronian conglomerate.

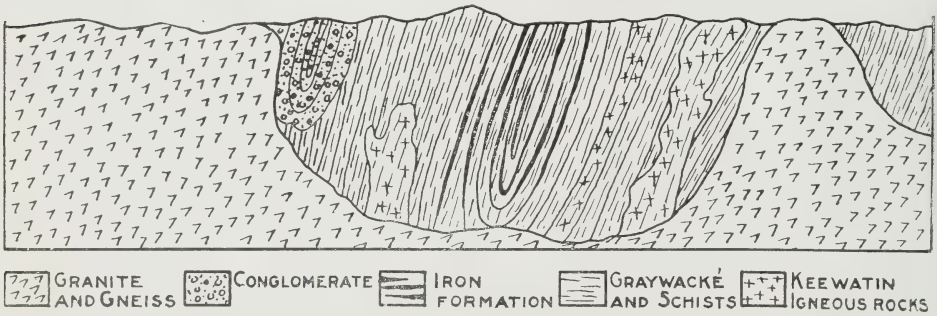


Fig. 6. Diagram representing the structural relations of the Keewatin, Laurentian and Huronian rocks.

It seems reasonable to regard as Keweenawan in age certain diabase dikes which occur in this area and are similar to the Keweenawan diabase in other regions.

There is nothing striking or unusual about the drift in the area.

Structural Geology

The structure of the lake Savant area, like that of most pre-Cambrian areas, is very complex. A glance at the map accompanying the report suggests that the long conglomerate band extending northeast near the northern border of the Keewatin rocks, and the band southeast of the narrows on lake Savant, striking so as to apparently converge with the former band, formed the limbs of an anticlinic pitching to the northeast. Although such a structure was kept in mind in the field, it was found impossible to establish any definite arrangement, and it was concluded that the form of the Keewatin areas is largely that assumed under the influence of the post-Keewatin folding accompanied by the intrusion of the granite, and that the conglomerate bands represent the remains of irregular synclines developed in the Keewatin, or along the contact between the Laurentian and Keewatin, when the post-Lower Huronian folding occurred. (Fig. 6.) The minor foldings in the Keewatin are very complicated, and it is probable that the same complications would be found in the larger folds if they were worked out. On Cliff lake it was at first found difficult to follow the strike of the schists, as one would

frequently pass from rocks with a north and south to those with an east and west strike. But later it developed that the structure was similar to that represented in diagram (Fig. 7), and the minor folds are an index to the structure of the major.

The Keewatin Rocks

The Greenstones and Green Schists.—As the stratigraphy table previously given shows, the Keewatin system is supposed to consist of greenstones, green schists, rhyolites, quartz-porphyries, tuffs, greywacké, fine-grained, grey gneiss and banded Iron formation.

The typical basaltic greenstones do not constitute nearly so large a proportion of the Keewatin system as they do in most other Keewatin iron range areas. In studying the region from west to east one is struck by the absence of the typical greenstone until he reaches lake Kashaweogama, where a small body of ellipsoidal greenstone occurs on the north shore, about one-fourth of the length of the lake from the west end. Little of this rock is then seen until lake Savant is reached, where a large area of it occurs on the southeast shore above the narrows. (Fig. 8.)

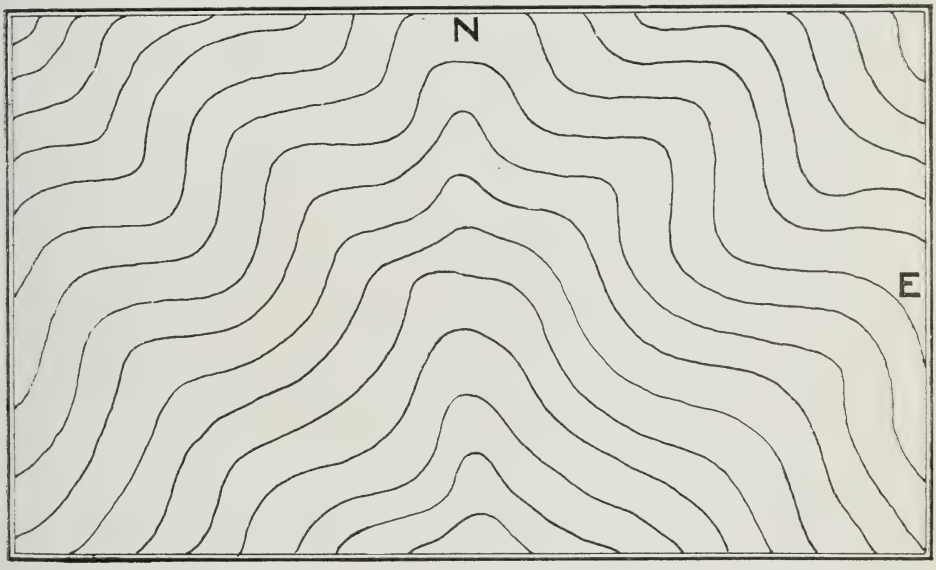


Fig. 7. Diagram illustrating in horizontal plan the folding of the greywacké and schists on the southern portion of Cliff Lake.

Although these are the most important outcrops of the typical extrusive basic rocks of the Keewatin, there are many outcrops of rocks, such as dark hornblende-porphyries, diorites and other rocks of average composition, so altered as not to be easily determined in the field, and it seems certain that many of the green schists have been developed from all of these igneous rocks. On the north shore of lake Kashaweogama, east and west of where the G.T.P. location line crosses the lake, there are considerable areas of diorite, but this rock seems to be fresher and on the whole younger looking than most of the Keewatin greenstones. Such was found to be the case with the diorites in other Keewatin areas,[5] and Mr. Collins makes the same observation for diorites in the Sturgeon lake area.[6] Some of the diorites contain quartz; and in most cases the feldspars are greatly altered, and the hornblende largely bleached and fibrous. For want of more definite evidence they have been classed with the other Keewatin greenstones.

[5] Iron Range north of Round Lake, 18th Rep. Bur. Min., 1909, p. 157.
[6] Report on a Portion of Northwestern Ontario Traversed by the National Transcontinental Railway, p. 16, Can. Geol. Surv., 1908.

The hornblende-porphyries were found in several places with the Iron formation in extremely complicated relations. These occurrences were noted chiefly in the Iron formation just south of lake Kashaweogama. When these rocks have been highly metamorphosed a hornblende schist is a characteristic result. The porphyries usually occur as a fine-grained, greyish-white rock, with dark spots of hornblende. In thin section the ground mass is found to be composed of feldspar and small crystals of hornblende, the former somewhat saussuritized and showing considerable zoisite. In one case a number of deep blue hornblende crystals were seen as phenocrysts. Iron pyrite is common, and is usually partially altered to limonite.

The Rhyolites and Quartz-Porphyries.—The rhyolites and quartz-porphyries are rather widespread, the most prominent areas lying around lake Houghton and along the lakes south of lake Savant. They are often highly metamorphosed and hard to distinguish from the grey, fine-grained gneiss, some of which has been developed by the



Fig. 8. Greenstone hills on the shore of Lake Savant.

metamorphism of these rocks. The quartz-porphyries are light grey or pinkish in color, and often contain distinct phenocrysts of quartz. One striking feature is the blue opalescent color of the phenocrysts near the contact between these and the Laurentian granite. In thin section there is nothing unusual about the color of the quartz, but in the hand specimen this feature was so striking that one could often recognize the proximity of the contact by the presence of the blue quartz crystals. Beyond this there is nothing peculiar about the rhyolites and quartz-porphyries, unless it be the unusually coarse nature of this rock along the railway try-line a short distance west of lake Kashaweogama, where the quartz phenocrysts are as much as a quarter-inch in diameter. They seem to represent the acid phase of the Keewatin eruptions, intrusive and extrusive. Near the southern portion of lake Houghton, as Mr. Collins mentions, there is a crushed quartz-porphyry, north of which the rock has been so weathered and rearranged as to resemble a grit of some sort.

The Fine-Grained Grey Gneisses (Couchiching?).—Grading into the main porphyry area, closely associated with the masses of quartz-porphyry and rhyolite described above, there are large masses of fine-grained, light grey gneiss, often granular and sugary in appearance, which the writer regards as equivalent to the Couchiching described by Lawson in the Lake of the Woods region. The relation of the gneiss to the acid eruptives of the Keewatin in this area has led to the conclusion that a portion of the gneiss has been developed by the dynamo-regional-metamorphism of the acid eruptives, and the remainder by the disintegration and partial decomposition, by weathering, of these rocks. The resemblance of this gneiss to the Laurentian gneiss is so strong that an inexperienced person readily confuses them, and yet there is, to one accustomed to both types, a characteristic difference. The Laurentian is, on the whole, coarser, darker in color, and not so granular and sugary in texture. The prospectors and others in the area readily

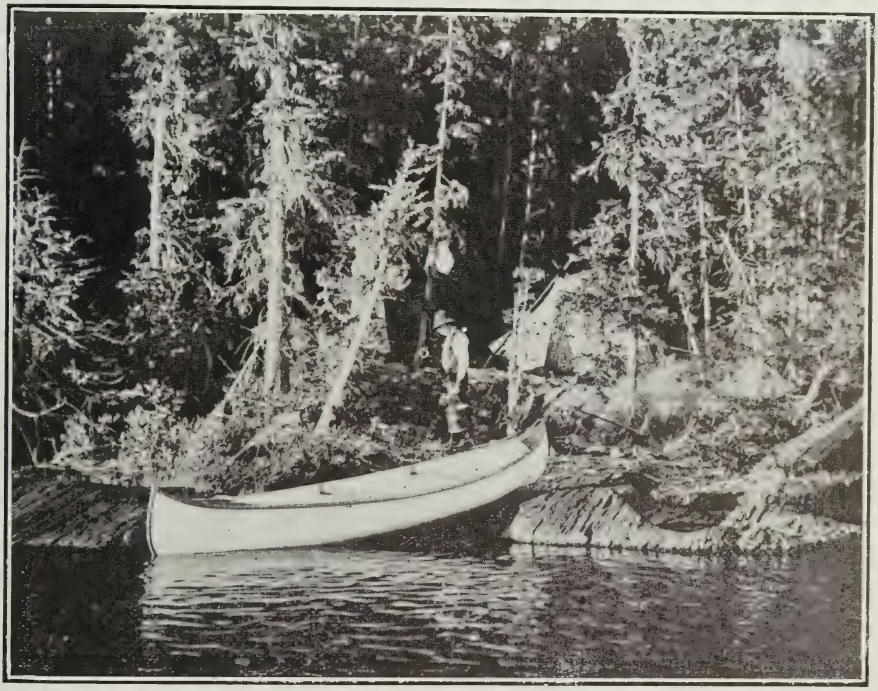


Fig. 9. Camp on an island in Lake Kashaweogama. A pot hole may be seen in the schist just to the right of the bow of the canoe.

mistook large areas of this gneiss for the Laurentian. That it is older than the Huronian conglomerate and also than the Laurentian is shown by the abundant pebbles of the rock in the conglomerate, and the numerous places where it is cut by the granite. It is closely associated between Pickerel and Grebe lakes with Iron formation, the latter occurring as narrow bands in a sedimentary type of this rock.

The distribution of the gneiss is quite extensive as it occurs as a band, in places as much as two miles wide, extending from Schist lake across the long southern bay of Island lake, lake Houghton, Pickerel lake to lake Savant. It also occurs along the north central portion of lake Kashaweogama.

A specimen of this rock collected on Schist lake is bright grey in color, and finely banded, with thin streaks of biotite running through it. Under the microscope the section consists of a very fine-grained quartz matrix with streaks of larger grains of quartz, and greenish-brown, strongly pleochroic biotite running across

the section at rather regular intervals. The plates of biotite are very small. Little particles of magnetite occur rather widely distributed, but also segregated along the lines of the biotite bands. Two small grains of bluish tourmaline were seen, the source of which is probably the Laurentian granite. The presence of biotite is a characteristic feature.

Sericite Schists.—Along the north shore of lake Kashaweogama, just east of the point where the railway line crosses the lake, there are a number of bands of sericite schist consisting almost entirely of quartz and sericite. The bands of schist vary in width from 2 feet to 20 feet, and they are distributed along the shore of the lake for a couple of miles. The rock is cut up by greenstones in such a manner as to suggest that the sericite schist has been formed by the contact metamorphism of quartz-porphyry intruded by greenstone.

Quartz Veins and Gold Placers.—Mention has already been made of the numerous quartz veins occurring in the lake Savant area. These veins begin to attract attention in the Keewatin in the western portion of the tract, but become very prominent on



Fig. 10. Pot hole in schist on shore of island in Lake Kashaweogama. The water has enlarged a hole begun by the ice.

Island lake. They vary in width from mere stringers to ten feet, and consist either of pure white quartz or of white quartz highly charged with pyrite and muscovite. No free gold was found in these veins, though a few pannings were made, and a diligent search was instituted in a number of the veins. Prospectors have also found them barren, as so far as observed none of the veins had been staked, though they had been tested by shots in a number of places. As the veins resemble those which appear to be connected with the Laurentian intrusion in the Sturgeon lake region farther south, and as fragments of similar vein quartz were often found in the Huronian conglomerate, it seems probable that they are about Laurentian in age.

There have been reports of gold placer discoveries on the lower portions of lake Savant, and Prof. Miller in 1903 describes some placers on the islands and the shore of the lake in the vicinity of the narrows.[7] The gold occurs in the sand, which here forms a large portion of the glacial drift, and Prof. Miller considers that its source was the quartz veins in the surrounding Keewatin rocks. When the writer visited the area a very short time was spent in this vicinity, and although a few pannings of the sand from several placers were made, he was not successful in obtaining colors of gold. This cannot be taken as evidence that no gold is present, since, as Prof. Miller states, the gold is rarely found by panning, but an analysis by fire assay often reveals its presence when panning does not. His analyses show the gold values varying from a trace to $2.00 a ton of 2,000 pounds.

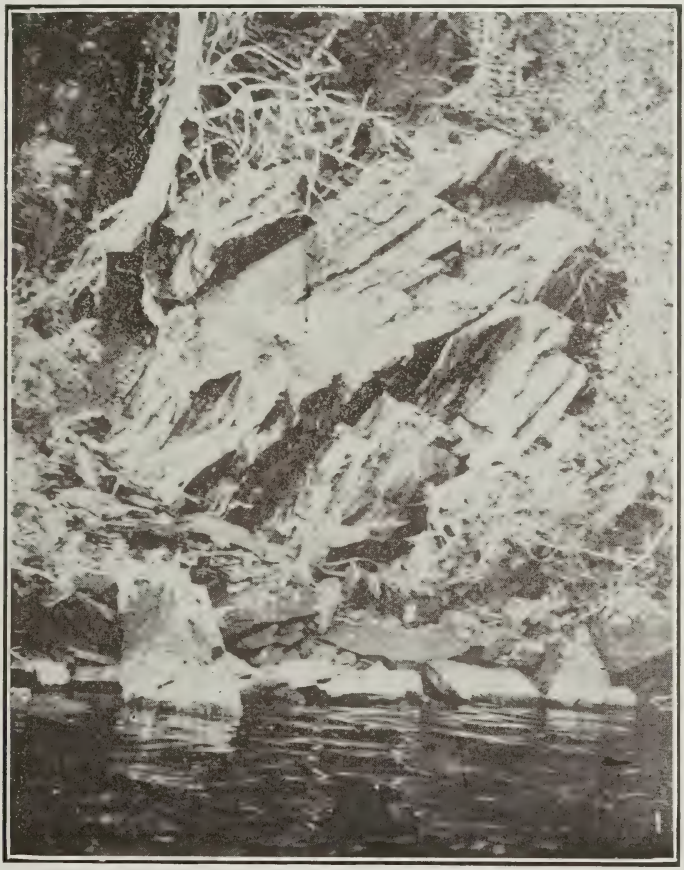


Fig. 11. Greywacké on shore of Iron Lake.

Greywacké.—Greywacké is a widely-distributed rock in the lake Savant area. It is especially abundant along the west shore of the lake, where it extends from below the narrows northward to beyond the portage from Iron lake. It is often very schistose, and in places where fine-grained grades into a slate. (See Fig. 10.) In the vicinity of the conglomerate it passes into that rock; but a distinction must be made between the Keewatin and Huronian greywackés. The Keewatin greywacké forms the country rock

[7] 12th Rep. Bur. Min., 1903, pp. 88-90.

for the greater portion of the Iron formation, and along the west shore of lake Savant is interbanded with narrow seams of iron oxide. These seams may vary in width from a half-inch to a hundred yards of impure Iron formation.

The greywacké containing the bands of iron is regarded as Keewatin in age, because pebbles of this rock occur in the Huronian conglomerate and are also cut by the Laurentian granite.

The greywackés are monotonous rocks of a dark grey color, often weathering to light grey. In thin section they are found to be composed chiefly of angular fragments of quartz and feldspar lying in a finer matrix of the same materials. The feldspars are often largely the lime-soda type, but also frequently predominantly orthoclase. Iron carbonate, limonite, pyrite and magnetite, especially the first, are characteristic minerals. A little hornblende often occurs, and chlorite is plentiful. The composition of the rock suggests its derivation chiefly from basic igneous rocks, as the feldspar is the type occurring in the latter, and what might appear to be an excess of quartz for such derivation may be partially accounted for in the supply of free silica furnished by the decomposition of silicates. The decomposition and rearrangement of minerals in all these old rocks have been extensive. The general absence of much evidence of water action seems to point towards much sub-aerial rock decay.

The Iron Formation.—The Iron formation has a wide distribution. Beginning on the west shore of lake Savant, it extends more or less continuously westward for about 25 miles, reaching beyond the southern end of Cliff lake. Narrow bands of magnetite and jasper occur in the greywacké all along the west shore of lake Savant from the narrows to beyond the portage from Iron lake. Few of these bands are large enough to merit attention. There is a small outcrop on the east shore of the lake just south of lake Savant. South of the eastern portion of lake Kashaweogama the range becomes more concentrated, and the most important portion of it occurs in this vicinity. The range is here about one mile wide, with a band about a quarter-mile wide fairly free from country rock. South of the main band there are a number of parallel narrow bands of no economic interest. The main band narrows where it comes out on the shore of Kashaweogama, and the range is only represented by small outcrops on a few islands, until near the western part of the lake, where a small outcrop occurs in a large hill on the north shore, only to disappear in a large swamp and reappear again around the south end of Cliff lake.

Part of the western portion of the range is composed almost entirely of banded quartz and actinolite. The rock is quite similar to the regular Iron formation, but the percentage of iron is so small that it has all been employed in the development of actinolite, leaving no excess of iron oxide. Associated with the actinolite are crystals of grünerite, the brown amphibole, and in one section a couple of crystals of augite were recognized by the extinction angle of about 50 deg. These bands in the western portion are narrow and of little economic importance.

Composition of the Iron Formation.—The Iron formation consists of banded red jasper, and magnetite and quartz in the form of interlocking crystals developed by the crystallization of chert. The bands in the jasper vary in width from microscopic size to a quarter-inch or even an inch in width. This banded jasper is again interbanded with wide and narrow bands of greywacké, hornblende schist and a grey, fine-grained gneiss. By far the most common rock occurring with the red jasper and magnetite is greywacké, and the bands of jasper and greywacké vary greatly. In places there is as much as 50 feet of almost pure red jasper and magnetite, while in others these minerals occur as bands only an inch or two wide in large masses of schist or greywacké.

The greater portion of the range contains a large percentage of magnetite, apparently the result of excessive metamorphism. Where the range is in proximity to the granite, as it is in many places, the iron is largely in the form of magnetite. Where the iron is not in excess of the magnesium and silica necessary to make actinolite, an actinolite schist with little magnetite is the result. The percentage of metallic iron in the Iron

formation is, on the whole, rather low. Two analyses of samples taken from the main range south of lake Kashaweogama and analysed by Mr. N. L. Turner, Provincial Assayer, gave the following results:

		Per cent.
Specimen No. 265.....	Metallic Iron	33.36
	Silica	50.20
Specimen No. 271.....	Metallic Iron	43.82
	Silica	39.00

One of the prospectors, Mr. M. Kane, who is interested in some of the claims, kindly furnished the writer with a table of three analyses made for him by Mr. W. W. Benner, analytical chemist, Port Arthur. The results are as follows:

		Per cent.
Sample No. 1.....	Metallic Iron	42.41
	Silica	37.86
Sample No. 2.....	Metallic Iron	70.07
	Silica	2.30
Sample No. 3.....	Metallic Iron	51.53
	Silica	24.04



Fig. 12. Shaft on iron range on South Shore of Lake Kashaweogama.

These figures are obtained from the analysis of picked samples, and while they cannot be taken as representative of the iron content of much of the Iron formation, they indicate that there are spots in the range where concentration has taken place. There has been a good deal of test-pitting and stripping, and one or two shafts have been sunk 15 or 20 feet (Fig. 12), but no drilling has been done, and so far nothing which can be regarded as "pay ore" has been located. The greater portion of the Iron formation, even where free from schist, does not carry more than from 30 to 35 per cent. of iron.

There are, however, certain features about this range which appear to the writer to make it a little more promising than many other low-grade Keewatin ranges found in

northern Ontario. The jasper and magnetite lie in a vast quantity of sedimentary rock, and as this rock is closely folded there are indications that the Iron formation extends to great depth, as the synclines do not appear to be so shallow as in many areas where igneous rocks break up the continuity of the strata. The range is in this respect a little more like the Huronian than the Keewatin ranges. In the greater depth there seems to be a factor favoring concentration at considerable distance below the surface. There is also evidence in many places of the leaching of silica and iron, leaving the Iron formation in a porous condition, as may sometimes be seen in the vicinity of ore bodies. The range is rather narrow compared with the ore-producing ranges with which the writer is familiar, and this feature is unfavorable to the occurrence of large bodies of ore, though in the widest portion its dimensions cannot be regarded as prohibitive of ore bodies of moderate extent. The only portion which is of any economic interest is the widest part south of lake Kashaweogama.



Fig. 13. Crumpled Iron formation, south of Lake Kashaweogama.

Genesis of the Iron Formation.—In a previous article may be found the writer's opinions regarding the genesis of some of the Keewatin Iron formations.[8] Since writing that article he has visited the Vermilion Range of Minnesota, and after seeing the great areas of jasper interbanded and in close contact with basaltic flows, can more fully appreciate the force of Dr. Leith's argument favoring these flows as the source of the solutions, which, poured out into the sea, deposited the jaspers. It was also noted that the acid eruptives and jaspers have to a large extent similar relations to those of the basalts and jaspers. In the Onaman Iron Range, described in the article just mentioned, the acid rocks seemed to occupy a much closer relation to the jaspers than did the greenstones, and there are several ranges in which these acid eruptives have similar relations. If they could be regarded as a probable source of the iron-bearing solutions, that might account for these relations and favor the igneous origin of the rocks in some cases where it is difficult to refer their source to the basic flows. The writer does not, however,

[8]18th Rep. Bur. Min., 1909, pp. 239-243.

regard them as the source of the ores, though they are a probable source of much silica. In the Savant lake area almost the only igneous rocks in close relation to the iron deposits are the hornblende-porphyries, which may be regarded in most cases as intrusive rocks. Whence, then, the source of the iron? There are no doubt plenty of igneous rocks in the region to supply the ore, but their relations to the jaspers do not seem to indicate them as the source. Instead of the igneous rocks being interbanded with the Iron formation, the latter is made up of large quantities of greywacké evidently derived from the partial decomposition of the igneous rocks. If the igneous rocks supplied the iron solutions to the seas there should be greater regularity in the distribution of the Iron formation, a smaller proportion of imperfectly water-worn sediments, and a closer relation between the igneous rock and the jasper.

For the Savant region it appears that conditions favor deposition in bodies of water of limited size and surrounded by land areas capable of furnishing the materials for the greywackés. The source of the iron must have been chiefly the igneous rocks which were

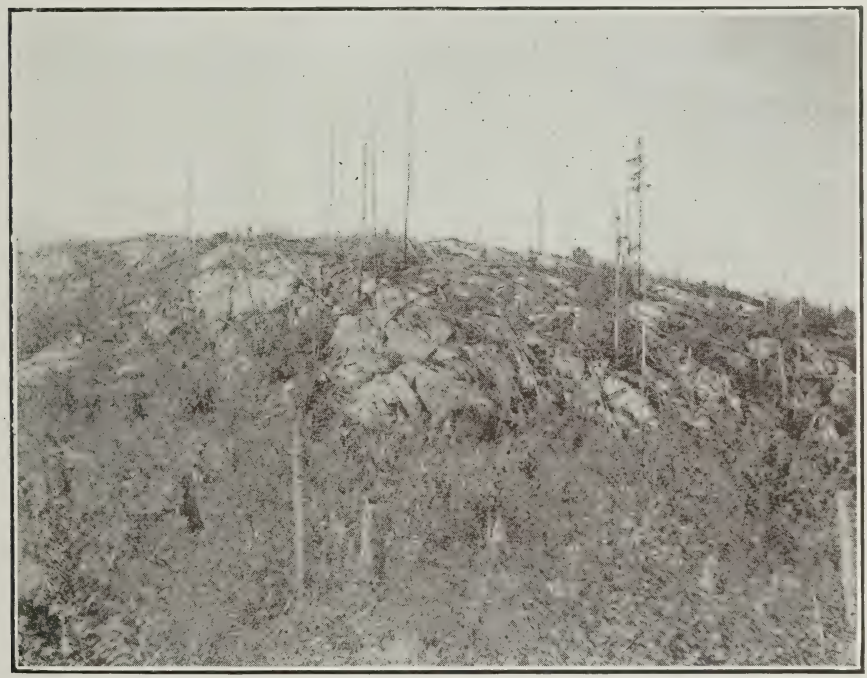


Fig. 14. Laurentian granite hill, near Dog river.

decomposed, supplemented to some extent by solutions supplied directly to the bodies of water by heated igneous rock. The Iron formation must have reached its present condition through extensive metamorphic processes by which rearrangement of the iron and silica took place, emphasizing the banded formation and changing the chert from a crypto-crystalline mineral to a granular crystallized mass. In this range, as in other Keewatin ranges, the earliest iron compound, the remains of which may still be recognized, seems to have been the carbonate, which is now very largely altered to magnetite by excessive metamorphism, while the quartz seems to have originally been in the form of chert. There are grains of pyrite scattered through parts of the narrow greywacké bands occurring with the jasper, but these do not appear to have any particular bearing upon the origin of the main iron deposits.

Laurentian Granite and Gneiss

The Laurentian granite and gneiss practically encircle the area under discussion, though in a few places the Keewatin throws out huge arms of green, which lie across the flesh-colored area in various directions. The rock is mostly a biotite gneiss or granite, but there is also a great deal of hornblende granite. Some of the granite looks much fresher and less metamorphosed than does the greater portion, and it is possible that there are in this area granites of two periods of eruption, though no definite evidence of this has been obtained.



Fig. 15. Huronian conglomerate on the shore of Lake Kashaweogama.

The Laurentian has supplied a great quantity of the material for the Huronian conglomerate, and the relations between these two rocks are very striking and will be considered when discussing the conglomerate.

The Huronian Rocks

The presence of large bands of conglomerate in the Savant area has been mentioned by Collins and McInnes, and the writer found, besides several minor outcrops, a band extending almost continuously from a point on a small lake below Schist lake through to lake Savant. The band is broken in Island lake, but otherwise it is represented by outcrops, large or small, for almost the entire distance. This rock seems to have had an important bearing on the formation of the main waterway, as the Dog river and several

of the large lakes lie along the band. There are also minor outcrops on lake Savant just southeast of the narrows; on the southeast shore of Pickerel lake there is a very small body, and south of Fisher lake a limited mass was seen. The latter outcrops were too small to be placed on the map, but they doubtless represent the outliers of a much more extensive body of conglomerate, the remains of which are now only to be found in synclines.

These bands of conglomerate are regarded as of Lower Huronian age because they lie upon the Keewatin and Laurentian, contain pebbles of practically all the rocks of those two systems, and are of the general characters of the Lower Huronian conglomerate in other regions. The most prominent pebbles are granite and gneiss, which vary in size from a half-inch to 20 inches in diameter. In some places the rock is crowded with these pebbles, while in other places they are sparsely distributed. Many are well rounded, but in other cases they are rather angular, and by reason of dynamo-metamorphism the larger proportion of them are drawn out into lenses or thin bands. (Fig. 15 represents very well an outcrop of this rock on the southwest shore of Lake Kashaweogama.)

A glance at the accompanying map shows that for a long distance the conglomerate band is in contact with the granite. This contact is rather puzzling in places, and Collins considers that the granite on Schist lake is in igneous contact with the conglomerate.[9] Although recognizing the similarity of this contact to an igneous type, the writer is of the opinion that the contact is rather due to a decomposition of the granite in place, just as the Keweenawan red shales can sometimes be seen passing by gradual transition from distinct shales in one place to solid granite in another, and yet the result resembles a metamorphic change due to contact action. In no case were granite dikes found cutting the conglomerate so as to show definite evidence of igneous contact.

On the shore of lake Savant numerous Iron formation pebbles occur in the conglomerate, and almost everywhere the rhyolite, quartz-porphyry, hornblende-porphyry, fine-grained grey gneiss and green schist pebbles may be found, though these are as a rule smaller and not so well preserved as the granite pebbles, which seem to have withstood the processes of metamorphism better.

No definite evidence of glacial origin for this conglomerate was observed, though what might be regarded as soled boulders were found in one or two cases. The pebbles on the whole seem to have suffered too much water action to have preserved any glacial striae, if they had ever possessed them. The thickness of the conglomerate is rather difficult to determine, as the rock has been so closely folded, but Mr. Collins appears reasonable in his estimate that it does not exceed 100 feet in most places. The dip is about 70 deg. on an average, and northward. The strike varies, but in many places runs about 60 deg.

The matrix of the conglomerate is a dark grey or green schistose material, in composition similar to a greywacké or arkose. In places it grades into a greywacké with very few pebbles, and from this to a distinct greywacké. At times the pebbles are so scarce that it is very hard to recognize the rock as conglomerate. Unless the transition is followed out in the field, it is difficult to distinguish between the Keewatin and Huronian greywackés.

One or two small outcrops of quartzite were seen in the region, but no bodies of such dimensions as mentioned by one writer[10] were seen. Even these masses might be regarded as nearer arkose in composition than quartzite. A few small bodies of arkose were observed, and it is probable that these arkoses and quartzites should be regarded as Huronian in age.

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[9]A Geological Reconnaissance of the Region Traversed by the Nat. Trans. Ry. between Lake Nipigon and Clay Lake, Ont. Rep. Can. Geol. Surv., 1909, p. 34.

[10]McInnes, Summary Rep. Can. Geol. Surv., 1901, pp. 92-93.

Keweenawan (?) Diabase

There are in several places in the area dikes of diabase which resemble those of Keweenawan age in the Nipigon region, and it is probable that they belong to that system, though there is no data to fix their age limit. They are the youngest consolidated rocks occurring in the area. Two of the dikes may be seen cutting the Laurentian gneiss on the portage leading north from Island lake towards Cliff lake.

Pleistocene Deposits

The fine glacial lake terraces of the Nipigon region are lacking in the Savant area. Though the drift is heavy in places, and completely buries the Iron formation from view, there are abundant rock exposures. The ground moraine forms large, low areas covered with swamp, and scattered over these are low knolls of drift, somewhat drumlin-like in form, and with their longer axes running in a general direction a little east of north. A terminal moraine lies along the south side of lake Kashaweogama near the eastern end, and prohibits access to the Iron formation in that vicinity.



Fig. 16. Features produced by weathering in a conglomerate containing very few pebbles, Lake Kashaweogama.

The direction of a few glacial striae was noted, and found to be about 30 deg. magnetic. The abrasive action of the glacier has been considerable, but apparently not so extensive as in other areas of greater topographic relief.

Summary

The Lake Savant Iron Range area is about 45 miles in maximum length and 12 miles in maximum width. It extends westward from the southern portion of lake Savant, and crosses the boundary between the districts of Thunder Bay and Rainy River.

The rocks of the area belong to the Keewatin, Laurentian, Huronian, Pleistocene and possibly the Keweenawan systems. The Keewatin system is composed of a complex of acid, intermediate and basic eruptives, intrusive and extrusive, and with these there is an unusually large percentage of sediments in the form of greywacké and fine-grained, grey gneiss. The Iron formation is of Keewatin age, and consists of red jasper and banded silica and magnetite. These minerals are interbanded with large amounts of greywacké. The banded Iron formation does not contain a high percentage of iron, and no "pay ore" has so far been struck, but the range is nearly 25 miles long, about one mile wide in the widest place, and it is probable that the syncline in which the Iron formation occurs reaches a great depth, as there is a thick mass of sediments associated with the range, and these are closely folded.

The Huronian system consists chiefly of conglomerate grading into greywacké, and in a few places to arkose. There are some small bodies of impure quartzite. The conglomerate is represented by an unusually continuous band extending across the greater portion of the area.

The Keweenawan system may be represented by a few dikes of diabase

The drift of the Pleistocene is heavy over much of the area, but there is nothing of striking interest in its occurrence.

NEPHELINE SYENITES OF PORT COLDWELL

BY H L KERR

Historical

The earliest mention which has been found of these rocks is in the Report of the Geological Survey of Canada for the year 1846-47. The same account occurs in the 1863 volume. In the latter report, on pages 80 and 81, it is stated that Pic island and Old Pic Point appear to be composed chiefly of a coarse-grained granitoid rock, consisting essentially of brownish feldspar and black hornblende. The report also mentions the occurrence of nepheline in these words: "Judging from the fragments on the shore, there are some beds composed of white feldspar, with occasional groups of orange red grains of eleolite, the whole studded with brilliant black crystals of hornblende, forming a very beautiful rock." In the same volume, on page 480, in the chapter on mineral species, the following sentence occurs: "Grains of orange red nepheline or eleolite are abundant with black hornblende in a white feldspathic rock, which is found in boulders on Pic island, in lake Superior." Again, on page 647, it is suggested that this nepheline rock may be miascite. The presence of zircons in the dark syenite is also noted in this place, which leads the writer to suggest a resemblance to the zircon syenites of Norway.

In the Geological Survey Report of 1871-74, Dr. Robert Bell speaks of the rock at the mouth of the Little Pic river as being granitoid gneiss.



Port Coldwell Harbor.

No further mention of these most interesting eruptives is found in any of the literature for the next quarter of a century. Then in 1898 Prof. A. P. Coleman, of the University of Toronto, while doing some work in the neighborhood of Heron Bay, discovered a new rock species, consisting largely of analcite, to which he gave the name "heronite." After giving a full mineralogical and chemical description of the rock, he says: "One naturally expects to find the dike containing the rock described in connection with some boss of nepheline syenite, but the slight examination hitherto made of the region by Dr. Bell and myself, has not disclosed any area of that rock."[1] Heron Bay, as a matter of fact, is less than ten miles from the eastern limit of the eruptive series, consisting largely of nepheline syenites, described in this paper.

[1]Journal of Geology, Vol. VII., No. 5, p. 435; also Rep. Bur. Min., 1899, pp. 172-174.

In this same connection Dr. Frank D. Adams describes microscopically two rock specimens from Peninsula Harbor, found in the museum collection at Ottawa. He notes the remarkable resemblance of these rocks to certain Norwegian species, and strongly supports Prof. Coleman's suggestion that nepheline-bearing eruptives must occur in the near neighborhood.[2]

During the summer of 1900 Prof. Coleman again visited the Heron Bay district, for the purpose of tracing the connection between the heronite dike and possible nepheline-bearing rock areas. While not successful in this, he was nevertheless fortunate in discovering certain other dikes containing nepheline, and thus obtaining more conclusive evidence of the presence of those rocks in that neighborhood.[3]

In 1901 another attempt was made by Dr. Coleman to locate the nepheline-bearing area. In his report to the Bureau of Mines for that year he says: "In connection with an excursion to the iron ranges of the Slate islands, an opportunity was taken to examine the railway and shore near Port Coldwell, and it was intended to visit Pic island, a few miles off shore, where Prof. Pirsson and others have suggested that nepheline rocks would probably be found, but unfortunately no suitable boat could be got at the little harbor, and this had to be given up."[4]

However, a trip was made along the Canadian Pacific railway track from Heron Bay to Middleton, and an extensive group of syenites was located, extending from three miles east of Peninsula as far west as Middleton. Among these were found a considerable extent of nepheline-bearing rocks and closely associated species, which Dr. Coleman briefly described in the Eleventh Report of the Bureau of Mines.

In this report he also notes the striking resemblance which these eruptives bear to those so elaborately described by Brögger from the Christiania region.

During the following summer Prof. T. L. Walker, of the University of Toronto, spent a few days collecting museum specimens along the C.P.R. in the same region. It was at his suggestion that the writer began the study of the specimens collected by himself and Dr. Coleman, with the idea of spending some time during the following summer in mapping the area in detail.

In the fall of 1906, six weeks were spent in the Coldwell district gathering information regarding the extent of these syenites. The weather was not very favorable for working, but a good section was obtained along the C.P.R. track, and a limited examination further north was made. Part of the coast was explored, and a couple of days were spent on Big Pic island. The work was left in such shape, however, that rather full information could be readily obtained during the next visit to the region. Compass lines were run north in two or three places, on which stakes were planted every six chains, so that these points might be connected up with future work.

During the fall of the next year another visit was made to the district with a couple of men, and the intention was to remain until satisfactory information regarding the whole area had been obtained. The weather conditions were more unfortunate than during the previous year, for it rained about three days out of four during the month spent there, and the weather not giving any evidence of changing for the better, the work was left in an uncompleted condition. We were more fortunate this year, however, in the matter of obtaining a boat, so that it was possible to spend a couple of days more on Big Pic island, besides getting an almost complete section along the coast, and visiting all the islands in the neighborhood. Little Pic river was also explored and some definite information obtained here, although even on that short trip heavy rains interfered with the work.

[2]Journal of Geology, Vol. VIII., p. 322.
[3]9th Rep. Bur. Min., 1900, pp. 186-191.
[4]11th Rep. Bur. Min., 1902, p. 208.

Although the information regarding the area is far from complete, yet the rocks collected include probably all the varieties occurring there, and it has been decided to publish the information collected, with the hope that at some future time it may be made more complete.

Distribution of Nepheline Rocks in Canada

Until a short time ago, nepheline rocks were considered of very rare occurrence. This was probably due to the fact that few men were able to recognize nepheline in the field. As far as Canada is concerned, these rocks can no longer be looked upon as curiosities, and it is very likely that as our great northland becomes more intimately known, other areas of these interesting eruptives will be located.

Although the Port Coldwell syenites are the earliest mentioned of all the nepheline-bearing rocks in the Dominion, it is but recently that they have attracted the attention of the petrographer, while several other areas have been described in the meantime in more or less detail.

Probably the most famous are the corundum nepheline syenites of east central Ontario. Several reports and papers have been written on this region by Professors Willet G. Miller, Frank D. Adams, and Dr. A. E. Barlow,[5] while a more exhaustive report for the Canadian Geological Survey is in the press at the present time.

Another important area which has been described by Adams and others, is found in the neighborhood of Montreal, embracing what are known as the Monteregion Hills, of which Mount Royal is the most famous.[6]

Dr. Willet G. Miller, who was the first to describe the central Ontario area in any detail, has discovered three other occurrences which are worthy of note. In 1891 he located an area about twenty miles east of the Ottawa river in the neighborhood of Hull, Quebec. He described them as being similar in character to the rocks of eastern Ontario, and believes a belt of considerable extent exists in this part of Quebec. In the same paper in which he refers to the Hull occurrence, he mentions an area discovered by himself 140 miles northwest of that place near Kippewa river, about 20 miles northeast of the south end of Lake Temiskaming. The rock exposure here, which is described as being 400 yards wide, shows well-developed schistose character and considerable variety of mineralogical composition. Like the area in eastern Ontario, it is associated with crystalline limestone.[7]

Dr. Miller has also described boulders of nepheline rock which he found near Sturgeon lake, 150 miles north-west of Port Arthur. He believes that an area of the rock *in situ* is to be found in this locality, basing his opinion not only on the presence of the many boulders of nepheline rock, but also on the field relations of certain other eruptives.[8]

Lawson has described a peculiar nepheline-bearing rock from Poohbah lake, Rainy river district, Province of Ontario. These nepheline pyroxene malignites, as Dr. Lawson has named the nepheline-bearing members of the group, are distinct from any other of the nepheline rocks of Canada, as far as is known.[9]

In British Columbia Dr. Barlow has briefly described certain nepheline sodalite syenites from the Ice river country.[10]

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[5] Am. Journal of Sci., Vol. XLVIII., July, 1894, pp. 10-18. 8th Rep. Ont. Bur. Min., 1899, pp. 205-240. Also see same Report, pp. 250-253 (on Corundiferous Nepheline Syenite), by Dr. A. P. Coleman. Geol. Surv. of Canada, 1892 and 1893, part J, p. 5. Transactions of the Royal Society of Canada, Third Series, 1908-1909, Vol. II., Sec. iv.

[6] Geol. Surv. of Can., Vol. XIV., Sec. O. Geol. Surv. of Can., Vol XVI., Sec. H., Geology and Petrography of Mount Yamaski, by G A. Young. Geol. Surv. of Can., Vol. XVI., Sec. G., Geology of Brome Mountain, Que., by John A. Dresser.

[7] Am. Geol., Vol. XXIV., p. 276. [8] Am. Geol., Vol. XXIV., p. 276.

[9] University of California, Bulletin of Dept. of Geology, Vol. I., p. 337.

[10] See Transactions Royal Society of Canada, Vol. IV., p. 81. Also see Geol. Surv. of Canada, Vol. I., p. 116B. Also Geol. Surv. of Canada, Vol. III, p. 111R.

Port Coldwell District in General

The Port Coldwell district, by which is meant that part of the north shore of lake Superior occupied by the eruptive rocks discussed in this paper, is situated about 125 miles, by way of the main line of the C.P.R., east of the city of Port Arthur. The section of country represented on the map accompanying this report, begins a few miles west of where the railway track first touches Lake Superior. Although the district is only about fifteen miles from east to west, the railroad which passes through it is over 21 miles long.

The whole country consists largely of high-rolling hills, with a very light covering of soil, the rocks in general being exposed and readily accessible for examination. The highest hills of the district are those consisting of the nepheline syenites. In the neighborhood of Red Sucker, and in the Coldwell Peninsula, they reach an elevation of 250 to over 700 feet above the lake, but the highest hill of the whole district is that found on Pic island, also nepheline syenite, which is about 850 feet (aneroid) above the lake. Both to the east and the west of this central part of the area, the hills are lower, and more rolling.

Forest fires have destroyed most of the timber along the railroad track itself, and the result is that most of the country for a mile back on both sides is covered with fallen trees, which makes travelling difficult. In the unburnt country exploration would



Looking west from near Peninsula.

be comparatively easy. The timber is all small, and consists chiefly of black spruce and balsam, averaging less than 10 inches in diameter, with stretches of white birch of a larger size, and here and there occasional fairly large white spruce. The timber would be very difficult to get out, excepting in the neighborhood of the Little Pic river, and it is doubtful if even there lumbering could be carried on advantageously.

Two or three excellent harbors exist along the coast, the principal one being Peninsula Harbor, which is doubtless sufficiently deep to accommodate any vessels sailing on the lake. It is well protected by the point known as Peninsula, as well as Lighthouse island. The lighthouse situated at the southern point of Lighthouse island is one of the landmarks along the coast. It is kept lighted from the beginning to the close of navigation, and serves as a guide for the vessels passing along the south on their way to the western ports. The harbor at Coldwell is also well protected. It is not nearly so large, but serves as an excellent haven for the fishing schooners of the district.

Port Coldwell itself is the chief settlement. Besides the station, which is over 100 feet above the level of the lake, a small collection of fishermen's houses is situated at the foot of the bay. At Middleton, the station master and his family and the section men are the only inhabitants. At all the other points in the district, the only inhabitants are section men and watchmen, and the total population, including the lighthouse keeper and his family, is probably less than fifty.

The only industry of the region is fishing, Port Coldwell being an important point along this part of lake Superior. Three or four outfits of fishermen ply their trade here during the open season, and several tons of fish are shipped weekly from the district to Montreal, Toronto, and eastern cities of the United States.

Extent and Relation of the Port Coldwell Syenites

These eruptions occupy the district from three miles east of Peninsula Harbor as far west as the C.P.R. station of Middleton, on the north shore of Lake Superior. They were found as far north as our exploration extended, excepting on the Little Pic river, where they are replaced by granites a mile or so from the lake. The coast line from Middleton to Peninsula is entirely taken up by them, and they also form all the islands in the neighborhood, including both the Little Pic and Big Pic. They therefore occupy a known area of approximately 100 square miles.

Chlorite schists and greenstones of Keewatin age are associated with the syenites along the lake shore in the east and the west. These Keewatin rocks have a northward extent of from four to twelve miles. In the east they are replaced by Laurentian gneisses and schists about twelve miles from the lake, as observed on the Big Pic river. In the neighborhood of Middleton, the Keewatin was found five miles to the north, as



Peninsula Harbor.

indicated on the accompanying map. Beyond this exists an immense area of Laurentian rocks consisting of schists, quartz-porphyries, granite gneisses, granites, syenites, etc.[11]

The syenites of the Coldwell massif are younger than the Keewatin, as shown by the numerous dikes of the former penetrating the latter. Beyond this, very little can be said regarding the relative age of the syenites in this petrological province to the surrounding rocks.

Directly north of the syenite area it is very probable that the country is occupied by Laurentian gneisses, schists, and granites similar to those found on the Little Pic in the west, and the Big Pic in the east. From information obtained from people living in the country, and from personal observation, it seems probable that the syenites extend to the north less than ten miles from the lake.

Where the granites of the west come in on the Little Pic river, no relationships were observed, and possibly the syenites merge without any sharp line of demarcation into the granites.

[11]See Geol. Surv. of Can., 1903-1905; Reports by W. J. Wilson and W. H. Collins.

The Nepheline Syenites

Owing to the variety of texture and mineralogical composition, it is rather difficult to give a single description that would apply to all the nepheline syenites. They may, however, be said to be holocrystalline, medium-grained granitic rocks, varying in color from pale to dark grey. In many cases they possess a distinct pink to purplish tint, owing to the presence in most cases of hydronephelite spreustein, which is a decomposition product of the nepheline. Frequently they possess a trachytic structure, due to the peculiar development of the feldspars. This is especially well illustrated in certain parts of the country north of Mile Post 78. In the most typical nepheline syenites, the dark constituents form a small percentage of the rock, but frequently these ferro-magnesium minerals are more important, and at times the hornblende in particular is developed into long, lath-shaped crystals with a more or less parallel arrangement, giving the rock a most characteristic appearance.

The hydronephelite spreustein, besides being present in various sized aggregations, from the size of a pin head to pieces half an inch or more in cross section, is finely disseminated throughout the rock. When in any considerable quantity, it gives the rock a very striking appearance, and frequently serves when less abundant to identify it as one of the nepheline series.



Looking west from Peninsula Harbor.

Occasionally the rock possesses a more or less gneissoid structure, but this is not at all common. A peculiar banded appearance was noted in a small area of the nepheline syenite on the west side of Coldwell peninsula. In this place the rock is made up of coarse-grained bands of light grey color, six inches to a foot wide, mottled with patches of spreustein, and carrying comparatively little of the dark minerals, alternating with much narrower bands of a darker color, and made up largely of hornblende. Occasional much smaller bands consisting almost entirely of hornblende occur.

The weathered surface, owing to the rapidity with which the nepheline decomposes, frequently shows the characteristic pitted appearance seen in the field in other localities.

Mineral Composition of Nepheline Syenites

The chief constituent, feldspar, is always readily recognized in hand specimens. Frequently the feldspar is present in rather well formed crystals, giving the rock a semi-porphyritic appearance, but this condition is not nearly so prevalent as in other associated rock types, and it seems to be confined in the nepheline-bearing members to

those rather poor in this constituent. Where well-developed feldspar crystals occur, they frequently possess a more or less parallel arrangement.

Nepheline with its characteristic oily lustre is readily discerned with the naked eye. In many cases it makes up as much as one-sixth of the rock. Again, it may be present in subordinate quantities, and only recognized with difficulty in hand specimens.

Hydronephelite spreustein or ranite is always present, and serves as a valuable index in the field.

Both hornblende and magnetite and the less abundant pyroxene are also easily distinguished. In most of the more typical varieties they are present in subordinate quantities, while in others they form a large percentage of the whole, sometimes indeed forming the bulk of the rock.



Face of nepheline syenite hill, just west of Fort Coldwell station.

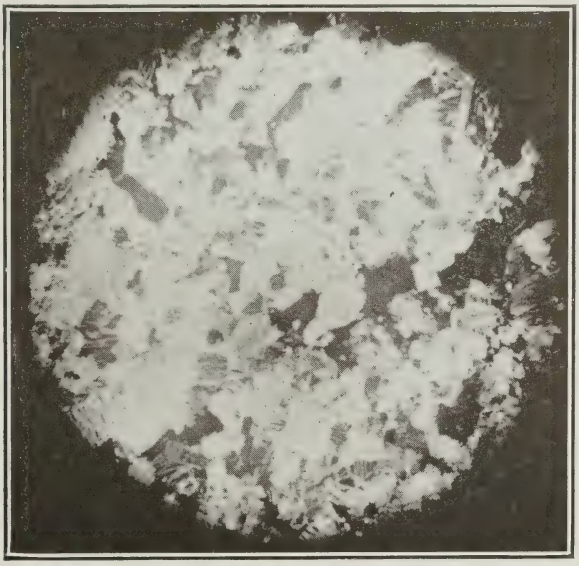
Feldspar

The most variable of all the minerals of these nepheline syenites are the feldspars. In few of the specimens studied has it been possible to find undoubted orthoclase in any quantity, nor on the other hand do any of the distinct nepheline syenites show plagioclase as the chief feldspathic constituent. All the feldspars belong to the natronorthoclase microperthite series. All gradations from the undoubted pure natronorthoclase to distinct microperthitic intergrowths of orthoclase and albite are found.

In the more distinctly nepheline predominating varieties, the sections of feldspar are more or less homogeneous in appearance, and it is only with difficulty, and by the use of the higher power of the microscope, that any albite lamellae may be found. The other varieties of the rock poor in nepheline show distinct albite twinning in most of the feldspar crystals, but with an irregularity of form and arrangement that is characteristic. Other sections show a decided difference in the intensity of polorization tints, which suggests lack of homogenity in chemical composition. This difference is

confirmed by testing the refractive index of the two parts by Beck's method. Then as the nepheline content of the rock becomes insignificant, the chief feldspar is microperthite, with the albite arranged generally in definite orientation, probably parallel to the steep othodom (801) as shown by Brögger, in the Norwegian occurrences.[12]

The feldspars usually occur in xenomorphically bounded crystal fragments, but at times well developed crystals occur, and as stated above, occasionally a semi-porphyritic appearance results. These subhedral crystals are quadratic to lath-shaped, parallel to the c axis. In the better formed crystals Carlsbad twins are quite common. Both where the plagioclase has a readily recognizable definite orientation, and where such definite arrangement is most difficult to determine, the plagioclase itself is characterized by the extreme irregularity of its individual parts. The microperthitic bands which cross the crystal parallel to the orthodiagonal are irregular in shape and of varying width; in individual bands they may wedge out in the centre of the section, or break up into several smaller bands, or one band may cross over the intervening space, and unite with another band. The same is true of the occasional fragments



Microperthite from the nepheline-poor syenite.

of albite, seen in the natronorthoclase. They possess no definite or constant form, but may appear in irregular patches, or lath-shaped particles running part way through the section and wedging out.

Under the low power many crystals appear absolutely homogeneous with uniform extinction in sections parallel to (010) of about 12° against the trace of (001). When examined by the higher powers, albite lamellae of extreme delicacy may be frequently observed in the section. Sometimes this twinning is only recognizable with the nicols in the 45° position. In cases where the feldspar is microperthitic in character, the albite part of it is almost invariably the fresher of the two. Even where no twinning lamellae can be seen, parts show a distinctly higher index of refraction owing to the higher soda content. Many sections display the characteristic moire structure common in the natronorthoclase from other localities.

[12] Zeitschrift f. Cryst. u. Min. band 16, 1890, pp. 524-551.

Besides this undoubted primary differentiation of the feldspar crystals, occasionally crystals are seen with an outer, clearer, fresh border, which upon closer examination is seen to be small crystal fragments of albite, which are undoubtedly of secondary origin, resulting from the breaking down of the original crystal.

The writer was fortunate in having access to numerous slides of the nepheline syenites from different parts of the world, which are in the University collection, being thus enabled to make comparisons with them. The rocks, the feldspars of which most closely resemble the Coldwell varieties, are those described by Brögger of Norway. Many of the specimens collected in the Port Coldwell area have exact duplicates among the Norwegian types. This resemblance is particularly well marked in many of the feldspars themselves. The descriptions and cuts given by Brögger[13] are duplicated on every hand among these feldspars, and, as will be seen below, the chemical analysis also corresponds very closely.



Microperthite from rock poor in nepheline.

The chief inclusions found in the feldspar are small crystallites of hornblende, augite, magnetite and biotite, with some very fine delicate crystals of apatite.

In many of the rocks poor in nepheline hypidiomorphically developed feldspars have a more or less parallel arrangement, simulating flow structure. Particularly good examples of this are found among the rocks along the line explored north of Mile Post 78.

Nepheline

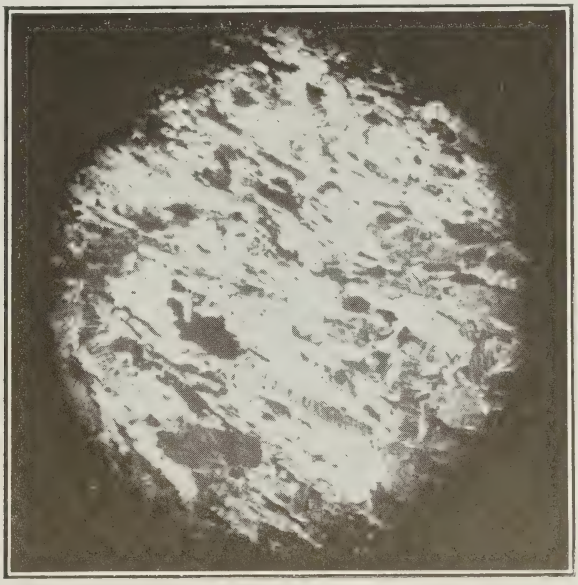
Nepheline is always the last constituent to crystallize. Almost invariably it is made up of irregular pieces filling in the spaces among the other minerals. It is usually partly decomposed, and not infrequently has been almost completely replaced by resulting decomposition products. Even here, however, it is usual to find a small fragment in the centre of the mass which is readily recognized as nepheline. Generally speaking, the nepheline is easily distinguished by its characteristic dark blue polorization color and definite arrangement of inclusions, or in the less fresh examples by the decomposition products. Where any doubt as to its identity was felt, microchemical tests were employed. It is much more abundant in some rocks than others. For instance, the rock in the big hill just east of Coldwell is probably made up of a sixth or more of nepheline; the same may be said of the rock on the west side of Coldwell peninsula, and

[13] See Zeitschrift für Krystal, u. Min. Band 16, 1890.

part of that on the south side of Pic island. Some show a very small percentage of this constituent, and it might be almost looked upon as an accessory mineral. This is true of most of the nepheline syenites on the north side of Pic island, as well as some found north of the C.P.R. tracks in the neighborhood of Mile Post 78.

Inclusions in the fresher specimens are made up chiefly of hornblende, and some augite with other small undetermined crystals. These inclusions are arranged chiefly parallel to the axial directions, being much more numerous in the direction of the c axis. Occasionally larger crystals of the feldspar are included in the nepheline mass.

Besides the hydronephelite spreustein described below, scales of muscovite are commonly present as decomposition products in certain localities.



Parallel arrangement of microperthite.

Hydronephelite Spreustein

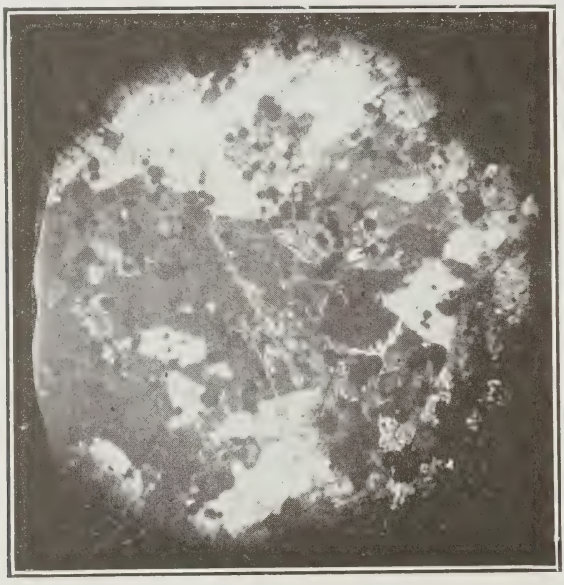
The most striking constituent in any of the nepheline syenites is the orange red decomposition product of the nepheline. As stated above, it occurs in nearly all of these rocks in crystal aggregates from the size of a hazel nut to fragments of microscopic dimensions. When present in any considerable quantity in the larger-sized aggregates it produces a most beautiful rock, which might be profitably used for ornamental purposes. It is undoubtedly the material referred to by Logan as orange colored nepheline.[14] In many places throughout the region small dikes, filling the contraction cracks which cut the main body of the rock in all directions, are made up largely of this substance. It was from one of these dikes in the west of Coldwell peninsula that the material for the analyses given below was obtained. This decomposition product corresponds most closely to the ranite or hydronephelite spreustein of the Norwegian rocks.

That it is a decomposition product of the nepheline is conclusively proven by the various stages of transition noted from different parts of the region. In a specimen of rather fine-grained rock obtained a mile and a quarter north of Mile Post 78, on the C.P.R., small specks of this mineral are numerous, and these under the microscope are seen to have the original form of nepheline crystals, with a small fragment in the centre of fresh nepheline.

[14]Geol. Surv. of Can., 1863. p. 480.

The idiomorphic rectangular form of these crystals is a rather unusual condition in the nepheline of this area, for, as already stated, it is usually found in irregular pieces filling in the spaces among the other constituents. From many other parts of the field various stages in the transition from the nepheline to the aggregate were observed.

Under the microscope this hydronephelite spreustein is seen to be made up of innumerable irregularly arranged masses of fibrous crystals, sometimes with a radial arrangement. Even in thin sections the characteristic red color is nearly always seen. However, the individual crystals are so extremely delicate in all the sections examined that even under the highest power it was found impossible to identify the different minerals.



Nepheline syenite.

Among the Norwegian rocks in the University collection are some from the Yttre Aro, Langesund Fjord, containing spreustein, which have an identical appearance in hand specimens with the Coldwell variety. A thin section of this particular rock was made, but even under the microscope no marked difference to the lake Superior variety could be detected. The chemical composition, however, places it with the ranite or hydronephelite rather than with the true spreustein. The following analyses are associated for purposes of comparison.

——	I.	II.	III.	IV.	V.
SiO_2	38.72	38.86	38.99	39.21	42.80
Al_2O_3	33.76	33.82	33.62	31.79	28.50
Fe_2O_3	Trace	Trace	.....	0.57	0.34
CaO	6.31	6.36	0.07	5.07	1.90
MgO	0.19	0.14	.....	.....	.....
Na_2O	9.56	9.38	13.07	11.55	14.33
K_2O	0.16	0.08	1.12	.....	0.30
H_2O	12.02	11.94	12.98	11.71	10.81
Total	100.72	100.58	99.85	99.90	98.98
Spec. Grav.	2.34	2.34	2.263	2.48	2.275

I. and II. Material obtained from small dike on west side of Coldwell Peninsula, by Mr. Rothwell, Fellow of Chemistry in School of Practical Science, Toronto.
III. Hydronephelite from Litchfield, Me., U.S.A.
IV. Ranite from the Island of Loven, Langesund Fjord, Norway.
V. Hydronephelite from Ice River, B.C.

Sodalite

One of the surprises of the nepheline syenites of the Coldwell area is the almost entire absence of the mineral sodalite. This mineral is a common constituent of the rock in many other localities, but here it is chiefly conspicuous by its absence. Although found in the rock in widely separated localities, yet that it is not a common constituent is shown by the fact of its absence from 75 per cent. of the sections studied. Where present, it occurs as irregular grains filling in among the other constituents, in the same way as the nepheline, but it is readily recognized by its constant isotropic properties. Although thin sections of nepheline cut perpendicular to the optic axis never give a well-marked interference figure, yet they usually give a distinct cross, while the sodalite, being isotropic, shows no such cross.

A more or less gneiss-like nepheline syenite which occurs two miles north of Mile Post 78 in the high ridge along the line explored here, has a fairly large percentage of



Zonal texture in the hornblende of the nepheline syenite from western part of Coldwell peninsula.

sodalite. The same is true of a specimen obtained from the top of the highest hill southwest of Coldwell station, inland from the west side of Coldwell harbor. The farthest projection of Pic island towards the southeast is also made up largely of a medium-grained, light-colored rock, different in appearance from almost every rock in the district, and carrying considerable quantities both of nepheline and sodalite. Outside of these three localities sodalite was rarely seen, and then always merely as an accessory mineral.

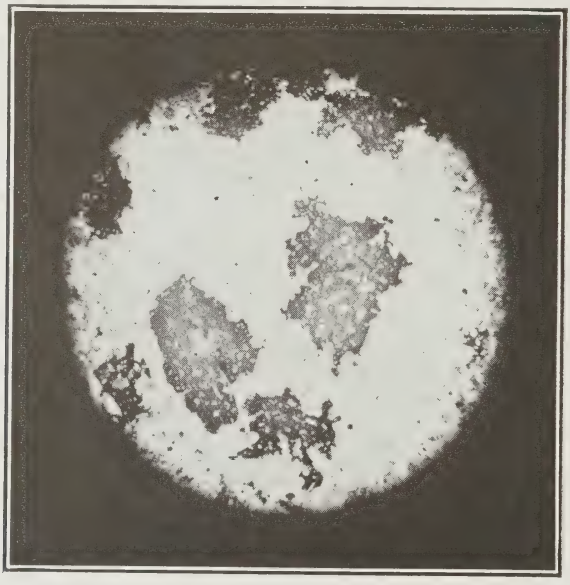
Hornblende

By far the most abundant and prevalent ferro-magnesium constituent of these nepheline rocks is hornblende. Usually the mineral has very imperfect crystal outlines. Frequently only xenomorphically bounded crystal fragments occur, and it is seldom found in well-developed anhedral forms. Occasionally there is a remarkable development of the crystal parallel to the c axis giving rise to crystals many times longer than wide. Some measured were found to be two to three inches long, and only a small fraction of an inch in width. There may be more or less parallel arrangement of the crystals in such cases, or a radial arrangement about a common centre. This excep-

tional development of the hornblende is, however, restricted in the nepheline-bearing types to small patches in the main body, and to certain small dike-like developments filling in contraction cracks.

Pyroxene is usually present even in the types where hornblende greatly predominates. Where these two minerals occur together, kernels of augite with a surrounding border of hornblende are abundant. In none of the sections examined was one observed in which hornblende formed the central part of an augite crystal. Sometimes this central part has well-developed crystal outlines, but usually is an irregularly bounded fragment. The relative size of the two bisilicates varies from that in which the augite makes up the major part of the crystal, to that in which it sinks to microscopic proportions.

In hand specimens the hornblende presents a brilliant black appearance on the cleavage surfaces. In thin sections it varies from green to chestnut-brown in color. Very frequently the interior of the crystals is much lighter in color than the outer



Poikilitic texture in hornblende in nepheline syenite. Augite kernel in centre of one hornblende crystal.

border. In the brown varieties there is a distinct difference in shade of color between the two parts, while in the green type a pale green interior with a deep green border is found. In many cases the crystals have a spotted appearance, due to the different coloring; or again, are uniform in color throughout.

Pleochroism is very marked, and varies from different shades of brown and green to black. The most frequently observed colors were:

Parallel b chestnut brown.
Parallel a greenish yellow.
Parallel c dark brown.
with absorption: $b > c > a$

In the green varieties the predominating colors were:

Parallel b green.
Parallel a straw yellow.
Parallel c grass green.
with absorption: $b > c > a$

The crystals possess positive elongation, and are optically negative. Extinction angles are much larger than in most hornblende, 25° having been observed, although commonly they are less than this.

Twins are frequent, particularly in the brown varieties. Twinning plane and composition face is the front pinacoid (100). Occasionally polysynthetic twins are seen.

Prismatic cleavage is usually well developed. In many cases there is a well-marked parting at right angles to the prismatic cleavage.

It is probable from the above considerations that the mineral is barkevikite, although no chemical examination in proof of this supposition has been made.

In several places hornblende is poikilitically intergrown with the feldspar. This structure is particularly well developed in the rocks two miles north of Mile Post 78, and also along the north shore of Pic island. Magnetite as an inclusion is always present, and apatite in large, clear crystals is quite common.

Pyroxene

After hornblende, the chief dark colored constituent of the nepheline-bearing rocks is pyroxene. It varies from a deep green aegerine augite to a slightly colored diopside. Generally speaking, the pyroxene is present in hypidiomorphic to xenomorphic crystals. Only occasionally do well-formed crystals appear. The chief faces are (110), (010), (100), (001) and probably (101). The deep green aegerine augite is confined to the rock in which nepheline is most abundant. It will be described first.

The grass-green color of this pyroxene is one of the most striking features of any of the minerals present. In some specimens the color is practically uniform throughout the crystal, but, generally speaking, there is a distinct difference between the shade of green in the interior of the crystal and that along the outer rim. Where there is a difference, the outer rim is always the more deeply colored part, and it usually shows a distinctly smaller angle of extinction and more marked pleochroism.

The sections usually show an elongation parallel to the c axis, and, while the regular prismatic cleavage is, as a rule, well developed, yet in some cases it is practically absent.

Pleochroism is very strong in many cases, and shows the following relations in the more deeply colored varieties:

Parallel $\mathfrak{a}$ grass green.
Parallel $\mathfrak{b}$ yellowish green.
Parallel $\mathfrak{c}$ yellow.
with absorption: $\mathfrak{a} > \mathfrak{b} > \mathfrak{c}$

Where there is a difference between the interior and the outside of the crystal, the outer rim shows deeper shades of the same colors, with corresponding absorption.

Undoubtedly the chemical composition of this pyroxene varies in different rocks. This difference is shown by the variability in the intensity of color. Extinction angles also vary for the same reason. What appears to be the most characteristic aegerine-augite shows an extinction from 39° to 40°. This extinction is, as pointed out by Brögger for certain of the Norwegian pyroxenes of the same type, the direction of the greatest elasticity, while in diopside it is the direction of the least elasticity. As mentioned above, where the composition of the crystal varies, the extinction of the outer more deeply colored rim is always noticeably smaller.

The mineral is optically positive.

While pyroxene is usually present in the rocks of this group, it is commonly subordinate in quantity to the amphibole, and is frequently closely associated with it. Very often the pyroxene forms an inner kernel surrounded by a border of amphibole. In relative proportions these minerals vary from the case in which the pyroxene sinks to microscopic proportions in the centre of the crystal, to that in which the hornblende is present only as a rim on the outside. This illustrates again most strikingly the extreme variability in the mineral composition of these rocks.

In many of the nepheline syenites, diopside takes the place of the aegerine-augite. It is usually seen in irregular grains and subhedra, of a pale green color, occasionally showing a faint pleochroism in tints of green. Where crystal forms are at all developed the chief faces are (110), (100) and (010). Frequently a border of deeper green of an aegerine character has been found along the outer rim of the crystal. Here, as in the other variety of pyroxene, it often forms the kernel in the centre of a hornblende crystal. The characteristic prismatic cleavage is usually better shown than in the more sodaliferous type. Inclusions are chiefly grains of magnetite, and rather large crystals of clear apatite.

Biotite

Although biotite is by no means a common constituent of these nepheline syenites, nevertheless it is found in many places in small irregular fragments associated with the other dark constituents, and occasionally, as for instance in certain places in the southwest part of Coldwell peninsula, it is the chief dark colored mineral of the rock. It is the common brown to green biotite, and possesses no unusual features worthy of notice. In the beautiful pink nepheline syenite which occurs as a dike at Mile Post 79 on the C.P.R., a deep green biotite, which is the only dark silicate present, is invariably associated with grains of magnetite, about which it is arranged in small scale like crystals as an outer border. These small dark specks unite with the little pink spots of hydronephelite-spreustein in giving this particular rock a striking appearance, seen in no other place in the field.

Muscovite

Besides being a frequent decomposition product of the nepheline as noted above, muscovite was found in a few cases as an original constituent. This is true of certain varieties of the rock seen in the west part of the Coldwell peninsula about midway between Pic channel and the C.P.R. tracks, along the most westerly line explored. It occurs as small aggregates of irregular scale-like crystals, readily detected by the high polorization colors and characteristic cleavage.

Sphene

Reddish brown crystals of sphene were found in sections of the rock from certain localities, but it is not by any means a prominent constituent. Occasionally it occurs in rather well-developed crystals, but generally is present in irregular anhedra. It is most frequently seen in rocks containing biotite, and in certain sections of a typical miascite from the southern part of west line through the Coldwell peninsula it occurs as a border around grains of magnetite. It is slightly pleochroic in different shades of brown.

Magnetite

Besides occurring as inclusions in the other dark constituents, or forming centres about which biotite or sphene is developed, as noted above, magnetite is found also in scattered grains throughout the feldspar in many of the sections examined. Well-developed crystals are not common.

Grains of pyrite are seen very sparingly throughout the rock in the same association as the magnetite.

Fluorite is of rare occurrence, but is seen occasionally as purplish grains, which are perfectly isotropic.

Analyses of Nepheline Syenites

Chemical analysis of the two types found at Coldwell indicates that whereas the rock of the big hill by the small lake east of the station is a typical nepheline syenite of the foyaite variety, the rock nearer the station itself, and forming the high hill northeast of the little fishing village, has more the composition of a gabbro or essexite. The third analysis, given below, is of a nepheline syenite of a trachytic type, which unfortunately was slightly decomposed. The latter rock is from a mile and a half north of Mile Post 78, and represents a variety prevalent in that locality.

The last two analyses are associated with the analyses given of the Coldwell rock for purposes of comparison.

	I.	II.	III.	IV.	V.
SiO_2	55.59	55.11	60.92	59.70	51.90
Al_2O_3	23.55	16.76	21.34	18.85	22.54
TiO_2	.....	0.78	.....	.....	.....
P_2O_5	.....	0.49	.....	.....	.....
FeO	3.28	5.72	3.44	.....	3.15
Fe_2O_3	.....	2.18	.....	4.85	4.03
MnO	0.45	0.28	.....	.....	.....
CaO	1.87	6.66	1.34	1.34	3.11
MgO	0.78	3.20	0.16	0.68	1.97
Na_2O	8.05	3.98	6.02	6.29	8.18
K_2O	5.04	3.25	6.33	5.97	4.72
H_2O	1.21	1.66	0.60	1.88	0.22
Total	99.82	100.07	100.15	99.56	99.82

I. Analysis of typical nepheline syenite, from just east of Coldwell station, by E. L. C. Forster, M.A., Fellow in Chemistry, School of Practical Science, Toronto University.
II. Analysis of nepheline-bearing rock, just west of Coldwell station, by F. A. Genth, of Germantown, Pa.
III. Analysis of nepheline syenite, from north of Mile Post 78, by E. S. Moore, B.A.
IV. Analysis of eleolite syenite (grey granite), by W. A. Noyes, Arkansas Geological Survey, Annual Report, 1890. Vol. II., page 88.
V. Analysis of laurdalite, Lunde, by G. Forsberg. Zeit. F. Kryst, u. Min., 1890, Band XVI., page 41.

Transition Stages in the Syenites

One of the most remarkable features of these syenites is the rapidity with which they change from coarse-grained varieties, where the dark constituents are subordinate, to finer textured, darker colored types where the dark amphiboles and pyroxenes stand out prominently, often with well-developed, long, lath-shaped crystals. Then, too, there is no distinct contact between the nepheline syenites and the other syenites with which they are associated, but a gradual transition from one to the other. This is also true of the changes from one type of nepheline syenite to another type. The latter feature is well illustrated in the neighborhood of Port Coldwell station. Here we can trace the gradual change from the pinkish grey nepheline syenite forming the high hill by the little lake east of the station to the dark grey type resembling diorite in the first cut west of the station platform, and forming the hill at the head of Port Coldwell harbor. The study of the two end types shows that while the rock of the big hill is preponderatingly composed of light colored constituents, natronorthoclase and nepheline with subordinate amounts of colored minerals, chiefly brownish green hornblende with some aegerine-augite, the rock in the immediate vicinity of the station is about equally divided between dark and light colored constituents, the dark mineral being chiefly diopside, with a relatively small amount of brown hornblende and a great deal of associated magnetite, while the feldspars are of the orthoclase variety with very much less associated nepheline. Small biotite crystals are also common in the latter rock, as well as large fresh apatite crystals. It is evident from relations observed in the field that the rock richer in nepheline solidified later than the darker colored variety, as small off-shoots or dikes of the former are found in the latter, although one rock as a whole changes by gradual transition to the other. Similar relations were observed between the hornblende syenite and the nepheline syenite in this neighborhood, discussion of which will be taken up later when describing the hornblende syenites.

In many cases, particularly north of Mile Post 78, a white alkali syenite, with a semi-porphyritic structure, forms an intermediate type between the red hornblende syenite and the nepheline syenite. In this rock the feldspar is usually present in fairly well-developed lath-shaped crystals, while nepheline is rather an accessory mineral.

A White Feldspathic Variety on Pic Island

A very striking rock which is closely related to the nepheline syenites occurs about the centre of Big Pic island, where it occupies the top of the highest hill. This hill, as a matter of fact, is the highest elevation in the whole country around Coldwell, being

over 800 feet above the lake level, and forms a conspicuous mark in the topography of the country when viewed from the lake or from the low-lying region in the neighborhood of Peninsula. One of the most noticeable features of the whole area, indeed, is this distinctly greater elevation of nepheline-bearing rock when compared with that of any other part of the district.

In hand specimens this rock bears a marked resemblance to a specimen of Litchfieldite from Litchfield, Me., in the University collection, a resemblance, however, not borne out by closer study of the rock. The great preponderance of the white feldspathic constituents produces a very light-colored rock, which color is accentuated by the fact that the dark minerals are segregated in small groups. Small specks of hydronephelite spreustein are sparingly present. The feldspars have in many of the crystals well-developed lath-shaped forms, which tend at times to the semi-porphyritic appearance so common in many of the rocks in the district. The rock is rather coarse-grained.

Under the microscope the chief feldspar is seen to be subhedral orthoclase, but in some of the sections albite appears to occupy just as important a place. Microperthetic intergrowths of the two feldspars are common, but the banded appearance of the albite in the orthoclase when the former is arranged parallel to the orthodiagonal of the latter —a condition which obtains in so many of the rocks of this group—was seldom observed in sections of this particular syenite.

Microscopic crystals of hornblende are found sparingly as inclusions in the feldspar.

As stated above, the dark minerals are collected in groups. The chief dark constituent is a deep brown hornblende, which is probably the same mineral as described in the more typical nepheline syenites. In many sections it appears practically opaque.

Ordinary brown biotite is usually associated with the hornblende. A few small fragments of muscovite were also observed.

One small crystal of augite in the centre of a hornblende fragment was the only pyroxene seen.

Magnetite and apatite are conspicuous associates of the hornblende and biotite.

Nepheline is of very secondary importance, occurring only in isolated grains of microscopic size among the feldspar crystals. Indeed, very little fresh nepheline was observed, it being usually broken up into its characteristic decomposition products.

Here, as elsewhere throughout the district, magmatic differentiation has resulted in dividing the rock into zones occupied by variant types, which, however, are bound together through a gradation of intermediate types. This particular rock forms the top of the hill referred to above; about half way down it has gradually given place to a light brown colored rock which is made up largely of the same constituents, but with a great deal of finely divided iron ores scattered throughout the feldspars, and further characterized by the total absence of nepheline. This brown rock then gives place by gradual transition to the typical red hornblende syenite found on the lake shore. Apophyses of the nepheline syenite are found cutting the dark colored rocks, proving that it was the last to solidify.

The chemical composition of the rock proves it to be closely related to the true nepheline syenites.

Analysis of White Feldspathic Nepheline Syenite

	I.	II.	III.	IV.
SiO_2	60.07	60.03	60.39	60.92
Al_2O_3	19.70	20.76	22.51	21.34
Fe_2O_3	0.21	4.01	0.42	.....
FeO	4.89	0.75	2.26	3.44
TiO	0.49	.....	.....	.....
MnO	0.43	Trace	.....	.....
CaO	2.27	2.62	0.32	1.34
MgO	0.55	0.80	0.13	0.16
K_2O	4.54	5.48	4.77	6.33
Na_2O	6.23	5.96	8.44	6.02
H_2O	0.48	0.59	0.57	0.60
P_2O_5	.....	0.07	.....	.....
Total	99.86	101.07	99.81	100.15

I. Analysis of white feldspathic rock, from Pic Island, made by E. L. C. Forster, M.A.
II. Analysis of Pulaskite (light colored), from Fourche Mountain, Arkansas; Annual Report, State Geologist, 1890, Vol. II., page 70.
III. Analysis of Litchfieldite, from Litchfield, Me.; G. S. A., II., page 241.
IV. Analysis of nepheline syenite (trachytic type), from one and one-half miles north of Mile Post 78 on C.P.R., by E. S. Moore, B.A.

Distribution of the Nepheline Syenites

The largest body of these rocks located is in the immediate neighborhood of Port Coldwell. They practically surround Coldwell harbor, and extend from this station in an easterly direction as far as Red Sucker bay, and form the bulk of the rock in this neighborhood, as seen on several short trips to the north. They occupy the coast line in places along the east and south side of the Coldwell peninsula, while a large body was located in the western part of the same peninsula. The two lines explored from Big Pic channel to the railway track would indicate that they occupy a considerable portion of the interior of the same region. North of Mile Post 78 large areas were also located as far north as the fifth mile on this line. The most typical nepheline syenites found on Big Pic island extend from the foot of South Bay as far west as explored. The northeast coast of the island is also largely occupied by nepheline rock, but of a somewhat less pronounced type, while most of that part of Little Pic island visited is also made up of the same eruptive.

Throughout the areas mentioned, while nepheline syenite is the largely predominating rock, other types are also present, but in greatly subordinate proportions. It is practically impossible, however, to indicate on the map sharp lines of demarcation.

Wherever the nepheline syenites were seen and it was possible to estimate the relative ages of the various rocks, the former were always found to be the youngest. Small dikes and off-shoots of the nepheline rock penetrate any and all other of the associated rocks with which it is in contact. This does not apply to the later eruptives which cut not only the nepheline syenites, but all the other rocks of the massif in numerous fine-grained dikes, the discussion of which will be deferred to a later part of this paper.

Red Hornblende Syenite

In the second rock cut west of Coldwell station a body of red syenite begins, which continues with interruptions for the next two miles along the railway track. The same rock occurs in considerable mass north of Mile Post 78 along the line explored in that neighborhood.

Between Coldwell station and the big nepheline syenite hill to the east occurs a small body of the same rock, which extends to the north with interruptions of the more sodaliferous eruptive as far as explored. Small areas are also found beyond Mile Post 78 towards Middleton, as well as along the lines explored through Coldwell peninsula. The same, or a closely related type, has been observed in several places on Pic island. Finally, in the region around Peninsula, and north of it, small sections are occupied by the same rock.

There is a great amount of variation in the red syenite, and the area of this rock shown on the accompanying map is not by any means occupied by it exclusively, but in all these sections it appears to be the preponderating rock. It is frequently associated with the dark augite syenite described below, and passes by insensible gradations into it. Good examples of this differentiation are found west of Coldwell station in the second rock cut, and in other places between this and Middleton.

In fact, a great deal of the rock along this part of the C.P.R. tracks is composed of the dark augite syenite, but its occurrence is of such an irregular nature that it was found impossible to separate the two on the map.

Then again, where the red syenite is associated with the nepheline syenite, a transition exists from the one to the other, a few of the salient features of which will be noted below.

This red syenite is, as a rule, fairly coarse-grained, but in places possesses the structure of an aplite. It is usually deep red in color, but varies greatly in this respect as it passes into the darker laurvikite, or into the lighter colored nepheline syenite. As a general rule the feldspars make up five-sixths or more of the rock, and the darker minerals, excepting in the finer grained varieties, are seldom more than one-sixth of the whole. The lath-shaped development of the feldspars, so common in all the rocks of the Coldwell massif, is also characteristic of the hornblende syenite. This is especially true of the lighter colored types intermediate between this and the nepheline rocks.

Pegmatitic dikes of the red syenite occur, cutting most of the associated rocks or filling the contraction cracks in the main body itself. These dikes are usually less than a foot wide, and are especially noticeable at times for the scarcity of dark minerals. In such cases the feldspar crystals are two inches or more long and an inch in width.

Components of the Red Syenite

The rock is composed of feldspar and hornblende with varying amounts of biotite, augite and sphene. Apatite and magnetite are the chief accessory minerals.

The feldspar is not by any means uniform in composition, but varies from orthoclase to microperthitic intergrowths of albite and orthoclase. In many cases orthoclase is the predominating mineral. This is true of the rock just east of Coldwell station, some of the syenite on the north side of Pic island, and a great deal of the rock north of Mile Post 78, as well as some of the red syenite west of the Pic river. On the other hand, the red syenite associated with the laurvikite west of Coldwell station is chiefly microperthitic intergrowths of albite and orthoclase, with individual crystals of these in subordinate quantities. The same relations are also seen in the syenites at the head of South Bay on Pic island, as well as in many other parts of the region.

These intergrowths are much the same as seen in other rocks of the area, excepting that true natronorthoclase does not appear to be present in many of the sections, and also in the general absence of a banded arrangement of the albite in the orthoclase where the former is parallel to the orthodiagonal of the latter. Very often the same crystal of orthoclase contains small inclusions of albite with the twinning lamellae, in some cases, parallel to the c axis, and in others parallel to the b axis—a combination of the albite and pericline laws. Subhedral crystals are seen only in those places where a semi-porphyritic development has taken place. The feldspars are usually deeply colored by clouds of hematite inclusions. Indeed, at times the crystals are almost opaque even in thin sections, owing to the great amount of this iron compound present.

Hornblende is the chief dark mineral, but it is always greatly subordinate in amount in all the coarser textured varieties. In some of the finer grained rocks, it is a more important constituent. It is always in anhedral grains, usually grouped with the other dark minerals. It is strongly pleochroic with the following relations in a typical example from near Coldwell station.

Parallel a yellowish green.
Parallel b chestnut brown.
Parallel c light olive green.
with absorption: $b > c > a$

It is undoubtedly closely related to the barkevikite of the nepheline syenites. Occasionally green diopside is seen as an inner kernel in the amphibole crystal. Apatite in large, clear crystals, and magnetite grains are always present in large amounts as inclusions. Sometimes the hornblende is practically opaque, and almost black in color.

Biotite is usually present in small amounts. It forms the chief dark mineral in some of the syenites at the head of South Bay on Pic island. It frequently contains lense-shaped inclusions of feldspar between the cleavage plates.

Pyroxene rarely occurs in any of the specimens studied, excepting as a kernel in the centre of the hornblende crystal.

Titanite, in euhedral crystals of characteristic shape, is frequently associated with the other dark minerals. It is very slightly colored.

A few grains of quartz are found in some of the sections, particularly to the north and west as the granite country is approached, or where the syenite is associated with the distinct quartz syenites.

Variant Nepheline Syenite Types

Although there is no distinct contact between the nepheline syenite and the red hornblende syenites as seen just east of Coldwell, the rock mass is differentiated into most distinct types, the extremes of which are separated by only a few yards. This gives rise to a great number of intermediate rocks, a description of which would carry us beyond the limts of a paper of this kind. On the one hand, we have the typical hornblende syenite, as described above, and on the other hand, the dark nepheline rock composed essentially of natronorthoclase, some orthoclase, microperthite, augite with the deep green aegerine borders, and subordinate quantities of hornblende and biotite, with varying amounts of nepheline filling in the interspaces among the other minerals, besides the ordinary accessory constituents.

A number of specimens collected three feet apart along the face of one of the rock cuts just east of Coldwell station shows the following changes in going from the hornblende syenite to the nepheline syenite. Augite gradually displaces the hornblende until it becomes the chief dark constituent. Biotite is a prominent mineral in the middle members of the series, and, while it occurs throughout, it becomes in both extremes subordinate to the hornblende on the one hand, and to the augite on the other. The feldspar, which in both extreme types is principally of the cryptoperthite variety, becomes in the intermediate type chiefly oliogoclase, with some more basic feldspar, and while in the hornblende syenite it is brick red in color owing to the presence of hematite inclusions, in the grey nepheline syenites these inclusions are entirely absent. In some of the intermediate species olivine is an important constituent.

In this particular nepheline syenite, the nepheline does not appear to be a very prominent constituent, and in some of the sections studied from the first rock cut west of Coldwell, it is entirely absent.

Accompanying the transition from the red hornblende syenite to the dark colored nepheline syenite, there is a most decided change in the sp. gr. of the rock, ranging from 2.64 in the red rock to 2.85 in the more basic end of the nepheline rock.

In one of the intermediate members of the series, a very interesting relation was observed between some magnetite and pyrite. An inner kernel of magnetite was enclosed by a border of pyrite, which in turn was surrounded by a fringe of biotite crystals arranged perpendicularly to the outer border of pyrite. Serpentine was also associated with the biotite. Fine examples of reaction rims between olivine and feldspar, similar to those described in connection with the basic rocks of the district, are found in those members of the series containing olivine.

Apophyses of the typical nepheline syenites of the big hill east of Coldwell station are seen cutting both the red hornblende syenite and the dark grey augite nepheline syenite, as seen in the immediate vicinity of Coldwell station. Wherever relationships were observed, the type of rock rich in nepheline is always seen to be younger than any associated rock.

Augite Syenite or Laurvikite

Probably the most interesting rock of the district is the dark augite syenite, which occupies so large a part of the country in the neighborhood of Peninsula. At the western side of the area near Middleton another considerable body of a closely related rock is found. Between Coldwell and the Little Pic river it also occurs associated with the red hornblende syenite already described. Indeed, in this locality it occupies a large percentage of the area along the C.P.R. tracks. Johnson's island, and the contiguous coast line of Coldwell peninsula, the other small islands in the neighborhood of Johnson's Harbor, the three islands northeast of Big Pic, and a part of the shore of the Pic itself, are also made up of a closely related dark syenite.

The rock varies in color from dark brownish grey to black in certain localities, while in other places it ranges from reddish grey to dull red, accompanied in many cases, as seen just west of Coldwell, by an intermediate dull soapy brown rock. The dark grey to black type is the most prevalent. The most striking feature of the syenite in the field is the extraordinary plate-like, or lath-shaped development of the feldspars, which, in the freshly broken rock are strongly marked out by their bright shining cleavage surfaces. While this peculiar development of the feldspars is a common characteristic of the rock from all the above mentioned localities, it is especially well shown in the rocks from the Peninsula neighborhood. The feldspars are by far the most important constitutent, and owing to their dark color, the relatively small amount of ferro-magnesium mineral is not readily noticed, except where the feldspars have become bleached by the weather.

The rock is as a rule fairly coarse textured, the feldspar crystals being from a quarter to a third of an inch long, and from less than one-tenth to a quarter of an inch wide. In the finer grained varieties, the feldspars, although still possessing an idiomorphic development, are much smaller, with the two dimensions more nearly equal. Coarse-grained pegmatitic developments are seen in the main body itself as well as in narrow dikes. These evidently represent the last portions to solidify.

The general appearance of the typical rock is much the same as certain hand specimens of the Norwegian laurvikite which are in the University of Toronto museum. Usually the Coldwell rock is not nearly so coarse grained as the specimen seen of the Norwegian syenite.

As the writer has not seen the Norwegian rock in the field, it is possible that the hand specimens in the University collection, as well as the type of rock exported for building and monumental purposes, represents the more coarsely grained, and most readily marketable varieties, and that the main body of the rock is not greatly different in texture from the body of the Peninsula syenite. The Lake Superior rock may show upon closer investigation, areas just as coarsely textured as the examples of the original laurvikite mentioned.

Both in general appearance and, as will be shown below, in mineralogical and chemical composition, this rock bears a striking resemblance to the famous Norwegian laurvikite.

Mineral Components of Augite Syenite

The mineral constituents of the rock consist of feldspar, pyroxene, a subordinate amount of amphibole, biotite and olivine, with magnetite and apatite. Pyrite occurs sparingly.

The feldspar is much the same as a great deal of that seen in the other rocks of the region, and closely resembles that of the Norwegian laurvikite. It is chiefly a microperthitic intergrowth of albite and orthoclase, similar in character to that already described from the associated rock. True natronorthoclase as well as orthoclase and plagioclase are also found, but in subordinate amounts. Plagioclase is a more common constituent of the type occurring in the western part of the area.

Inclusions and stains of iron oxides and small crystals of pyroxene give the feldspars a dark color.



Natronorthoclase from laurvikite, near Peninsula.



Feldspar from the augite syenite (laurvikite).

Analysis of Feldspar in Augite Syenite

The analysis of the feldspar from a rock collected near Peninsula gives:

——	I.	II.	III.
SiO_2	64.11	66.08	66.95
Al_2O_3	20.31	18.77	17.87
Fe_2O_3	0.18	.....	0.90
CaO	1.61	0.37	0.52
MgO	0.30	.....	0.24
K_2O	7.08	7.68	7.82
Na_2O	6.16	6.54	5.20
Loss in ignition	0.10	.....	0.30
Total	99.85	99.44	99.80

For purposes of comparison, analyses of similar feldspars from other regions are also given. Number one is an analysis of a more or less homogeneous crytoperthite.

I. Analysis of feldspar from Peninsula rock, by H. L. Kerr.
II. Analysis of feldspar from Fredriskvarn, Norway, by G. Flink.
III. Analysis of feldspar from Fourche Mt., Arkansas, by G. W. Noyes.



Feldspar in laurvikite.

A comparison of the above results shows the close relation existing among the feldspars from the three localities.

Pyroxene is always the chief dark mineral. While idiomorphic forms are by no means rare, subhedral crystals are more common. The augite varies in rocks from different parts of the field. In the Peninsula district it is of a composite nature, consisting of a pale brown interior, with a deep green border, and is undoubtedly one of the aegerine-augite series. While the deep green part of th crystal is usually confined to the border, yet in many cases patches of the green are often irregularly scattered throughout the crystal, or again, the whole crystal may be more or less uniformly of a deep grass green color. Pleochroism is most marked in the deep green borders of the crystal. The following relations were observed in a specimen near Peninsula:—

Parallel a deep grass green.
Parallel b pale green.
Parallel c yellowish green,
with absorption $a > b > c$

The characteristic augite cleavage is well developed. The extinction angle varies with the composition of the pyroxene, but that of the deep green parts of the crystal is always noticeably lower than the brownish interior. For instance, certain measurements show the inclination of $a \wedge c$ to be 41° in the brown interior, while in the border and deep patches of the crystals $a \wedge c$ was 26°. Other measurements gave $a \wedge c$ 45° and 30° respectively. In these sections which do not show the maximum extinction there is always a marked difference between the border and the interior. The mineral is optically positive.



Feldspar from augite syenite.

An analysis of the pyroxene from the rock occurring at Mile Post 63 gives the following results:—

SiO_2	45.38
Al_2O_3	14.05
TiO_2	1.14
Fe_2O_3	8.21
FeO	12.27
CaO	14.06
MgO	1.46
Na_2O	1.80
K_2O	0.86
H_2O	0.86
	100.09

Sp. gr. 3.55.

The above analysis was made by D. E. Beynon, B.A.Sc. of the School of Practical Science, Toronto.

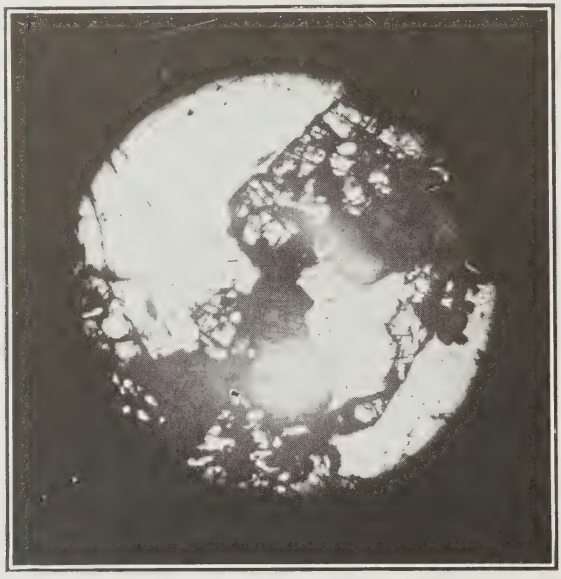
In the dark syenites between Middleton and the Little Pic river, the augite is distinctly different from that found in the Peninsula type. It is uniformly of a pale violet color, and weakly pleochroic, similar to that found in the olivine gabbro of the same part of the district. It is never in well formed crystals. Sometimes it is bordered by a rim of barkevikite. Characteristic pyroxene cleavages are not nearly so well developed as in the pyroxene found in the eastern part of the area. It carries numerous inclusions of apatite, magnetite, and biotite, and possesses the characteristics of ordinary augite. In the neighborhood of Coldwell, much of the pyroxene in this augite syenite is the same violet augite with hornblende borders. In the western part of the

Peninsula occurrences of laurkivite, diopside is a common constituent, and is frequently surrounded by a narrow rim of hornblende, which is partly of a dark brown barkevikite type, and partly of a bright blue arfvedsonite.

While the rock from the region of Johnson's island appears in hand specimens to be identical with that from other parts of the area, it has as a matter of fact in the specimens collected very little of the ferro-magnesium minerals, and indeed the dark brown hornblende seems to replace the augite almost entirely. It is just possible, however, that the specimen brought from this region is not a representative one.

An Interesting Olivine Type

While olivine is found in this rock, chiefly in the neighborhood of Middleton, yet it occurs sparingly in all the rock from the other localities. A very interesting type is a prominent constituent of the laurvikite in the neighborhood of Peninsula. Olivine found in the Middleton district is the ordinary kind, usually quite fresh, and requires



Laurvikite, showing augite, olivine and feldspar.

no particular comment. In the last rock cut along the C.P.R. tracks, east of Peninsula in the neighborhood of Craig's gravel pit, is an olivine somewhat unusual in appearance. It was mentioned by Dr. Adams in his description of the hand specimens from the Ottawa Museum collection, but was not named.[14] The writer sent the specimen through Prof. Walker to Dr. Brögger of Christiania, who states in his report: "The yellowish mineral in question is without any doubt an olivine (chrysolite), rich in iron. Extinction parallel; optic character negative; 2E ca. 100°, 2V ca. 60°; birefringence rather strong; dispersion of the optic axis high: $2V\rho > 2V^{\nu}$ for bisextrix ∞ etc. This olivine mineral corresponds very nearly with the olivine of the laurvikite of South Norway."

Less than one-quarter of a gram of this mineral was isolated for the purpose of making chemical tests, which, however, were not very successful, and as no more of the pure material could be obtained, although a couple of days were spent in Peninsula searching for it, no further chemical tests were made.

[14]Am. Journal of Science, Vol. XLVIII., July, 1894, pp. 10-18.

The larger pieces in reflected light are a pale green, in transmitted light amber yellow in color.

The mineral has a distinct resinous lustre and conchoidal fracture, and has a hardness of 5 to 5.5. In thin sections it is pale yellow in color. It has high relief, and is strongly doubly refracting. It always occurs in a hyphidiomorphic form, closely associated with the pyroxene. It is usually badly broken up by fracture planes which do not appear to have any definite crystallographic relations. The mineral is readily attacked by hydrochloric acid, leaving a white residue. Under the microscope between crossed nicols it has much the appearance of titanite.

As stated above, hornblende occurs sparingly in all the sections of these rocks. It is for the most part the ordinary brown barkevikite, similar to that described from the nepheline syenites. However, small quantities of arfvedsonite are found usually in irregular scales associated with the other dark constituents. In one section of the rock from the neighborhood of Peninsula, a small basal section of riebeckite was noted, which was readily recognized by its deep blue pleochroic color.

Biotite occurs sparingly, and is characterized by a deep chestnut brown color, and strong pleochroism. Besides this ordinary brown biotite, a rather interesting mica occurs in the laurvikite between the quartz syenites east of Red Sucker and the eastern limits of the massif. It occurs in small fragments of a marked brownish red color. Dr. Brögger kindly examined this specimen also, and says: "The mineral in question is probably a mica with 2V nearly equal to O°, cleavage perfect; extinction parallel to the cleavage; perpendicular to the cleavage, a negative opic axis; uniaxial; pleochroism very strong; γ greenish black or dark olive green; ∞ red brown to yellowish brown; sections parallel to the cleavage without pleochroism, greenish brown; birefringence high. Rosenbush-Wulfing (Miks. Phys., Vol. I., Part 2) mentions a biotite with nearly corresponding pleochroism." Another of the minerals which occurs in sections from the same locality is considered by Dr. Brögger as belonging to the same mica as that just described. He remarks regarding it: "The yellowish mineral in question is in some sections uniaxial, negative; $\gamma - \infty$ perhaps about 0.02-0.03. Other sections are biaxial. Some sections are pleochroic with ∞ brownish red γ greenish black. Occasionally these pleochroic sections are surrounded by a yellowish isotropic or nearly isotropic substance, which is probably a decomposition product."

Magnetite, pyrite and apatite occur in varying amounts, associated with the other dark constituents, but possess no features worthy of special note.

Fluorite. Grains of fluorite are very occasionally seen as bluish, isotropic fragments among the other constituents.

Quartz occurs sparingly in certain parts of the field, but in the typical rock from the neighborhood of the Peninsula it is entirely absent.

The chemical analysis of this rock shows that it is closely related to the laurvikite of Norway. For purposes of comparison, analyses of the laurvikite are associated with those of the Coldwell variety. The rocks analyzed were those collected near Peninsula, which the writer considers the type of rock most closely resembling the original laurvikite.

Analysis of Augite Syenite

	I.	II.	III.	IV.
SiO_2	58.37	58.81	58.88	56.19
TiO_2	0.97	0.70	.....	1.32
P_2O_5	0.21	0.31	0.54	0.22
Al_2O_3	15.11	13.37	20.30	17.43
Fe_2O_3	1.91	3.88	3.63	2.16
FeO	8.99	6.97	2.58	7.80
MnO	0.48	0.20	.....	Trace
CaO	3.32	3.89	3.03	3.29
MgO	0.57	0.51	0.79	.....
K_2O	4.09	5.42	4.50	.....
Na_2O	3.76	4.96	5.73	.....
Moisture	2.25	1.04	1.01	.....
Total	100.03	100.06	100.99	.....

I. Analysis of the laurvikite from near Peninsula, by F. A. Ghent, Philadelphia.
II. Analysis of a similar rock from near Peninsula, made by A. H. A. Robinson, of the Chemical Department of Practical Science, Toronto University.[1]
III. Analysis of Norwegian laurvikite from Byskoven, Laurik, by A. Merian.[2]
IV. Partial analysis of laurvikite from near Peninsula, containing a great deal of the yellow iron rich olivine, made by E. S. Moore, B.A.

In several of the rock cuts between Port Coldwell and the Little Pic river, variations are noted from a dark greenish grey rock closely resembling in appearance the laurvikite just described, but with a less pronounced idiomorphic development of the feldspars, through a soapy yellow colored rock of similar structure, to the ordinary red hornblende syenite. All these rocks as a rule are much less coarsely grained than the typical laurvikite. Under the microscope it is seen that they are composed chiefly of microperthite, similar to that found in the rocks all over the region, the regular dark hornblende, a very little augite, iron oxide, and quartz. The red variety has only odd grains of quartz, but the darker colored types have so much of this mineral that they might reasonably be classified as quartz syenites. Indeed, in one place on the accompanying map, such an area is indicated in this way. However, they all seem to be more closely related in constitution to the dark augite syenite than the former rock.

Quartz-bearing Rocks of the Coldwell Area

Quartz Syenites

The chief quartz-bearing rock of the region is found east of the Red Sucker. It occupies all the district south of the C.P.R. in this section, to within a short distance of Munro Bay. To the north of the track it extends for a distance of from two to three miles. Beyond Munro Bay to the east, it forms the long, narrow peninsula which is the northwest boundary of Peninsula Harbor, as well as the island upon which the lighthouse stands, and the large island in the harbor itself. To the west the same rock is found on Detention island, while Gull Rock is also formed of quartz syenites. Most of the shore of the northwest bay on Pic island, as well as the mainland immediately north of this, is occupied by a somewhat different but related rock.

These quartz syenites are not by any means uniform in appearance, or in mineralogical composition. The predominating color is dark red, a rock of this type occupying most of the district in the neighborhood of Red Sucker, and the two islands mentioned above in Peninsula harbor. Particularly towards the east it is much darker in color, and of a distinctly green shade. The transition from one type to the other is gradual.

The texture of the rock is medium grained granitic, with a more or less trachytic structure developed in places in the darker variety. It is characterized, especially in the red rock, by its extreme brittleness, which gives rise to great talus deposits at the base of some of the cliffs, a good example of which is seen just west of Munro Bay to the north of the railway track.

[1]Rep. Bur. Min., 1902, p. 211.
[2]Ibid, p. 211, cited from Zeitschrift fuer Kryst, u. Min. Band 16, 1890, p. 30.

The Red Sucker quartz syenite appears to be made up of rusty red feldspar and hornblende, with in most places a very little quartz.

Under the microscope it is seen that the chief mineral of the rock is feldspar, which as a rule is deeply colored by hematite, which is frequently segregated along cleavage cracks. The feldspar is mainly microperthitic intergrowths of plagioclase (chiefly albite) and orthoclase, and closely resembles the cryptoperthite of some of the nepheline rocks. The crystals are not as a rule present in well developed forms. Besides the albite twinning of the plagioclase, Carlsbad twins are quite common. Inclusions of hornblende, magnetite and hematite are abundant, while fluorite is seen occasionally.

Quartz is always present in polyhedral grains as a subordinate constituent filling in between the earlier formed crystals. Occasionally it is seen graphically intergrown with the feldspar. The amount of quartz varies very much in different parts of the field.



Lighthouse Island, Lake Superior.

The chief dark mineral of the rock is hornblende, but it is, as a rule, so badly broken up that very little can be made of it. In the less decomposed crystals, however, it appears to be more closely related to the green hornblende of the nepheline syenities. Decomposition has gone so far in many cases that all that is left to indicate the original hornblende crystals are grains of magnetite and stains of serpentine.

Biotite scales are found sparingly associated with the hornblende in some of the sections studied.

Magnetite is very plentiful, and owes its origin chiefly to the change which has taken place in the hornblende.

Hematite is present in large quantities finely scattered throughout the feldspar crystals. Indeed the feldspars are at times so dense from the presence of the hematite that even in thin sections they are practically opaque.

Pyrite in irregular grains is seen occasionally. Apatite is one of the common accessory minerals. Fluorite was found in the rock from Lighthouse island as small inclusions in the feldspars. Secondary calcite also occurs sparingly.

While the chemical analysis of this rock shows that it is not very closely related, as was at first suspected, to Brögger's nordmarkite, yet it bears a striking resemblance to the nordmarkite described by Szadeczky from Ditro Siebenburgen, Hungary, and should undoubtedly be associated with these quartz syenites.

Analysis of Quartz Syenite

——	I.	II.	III.
SiO_2	58.60	60.45	62.52
Al_2O_3	19.94	20.14	23.54
Fe_2O_3	4.25	3.80	2.15
FeO	2.42	.....	1.38
CaO	2.76	1.68	1.65
MgO	1.71	1.27	0.26
K_2O	4.84	7.23	4.02
Na_2O	3.24	5.12	4.16
H_2O	2.29	0.71	0.03
Total	100.05	100.40	99.71

I. Analysis of quartz syenite just east of Red Sucker.
II. Red quartz syenite, from Hillestadvand, Norway, Zeisch. F. Cryst, XVI., 54, 1890.
III. Nordmarkite, from Ditro Siebenburgen, Hungary, J. Szadeczky, N. J., 1901, I., p. 402.

Towards the eastern part of the area defined above, likewise on Detention island, the rock in places is very much darker in color, and whereas in the red, more acid type the feldspars form the bulk of the rock, the darker variety is made up more largely of ferro-magnesium minerals. On the weathered surfaces it usually presents a dark green appearance.

Under the microscope the rock shows much less quartz. It presents the same general characteristics as the quartz of the red rock, being occasionally graphically intergrown with the feldspar, but ordinarily in angular fragments filling in among the other constituents.

The predominating feldspar is also plagioclase of the albite-oligoclase variety. Both the orthoclase and plagioclase are full of inclusions of magnetite, hematite and hornblende.

The hornblende is the same as that of the nordmarkite, but in subordinate quantity, and shows the same tendency to decomposition. Besides this green hornblende, there is also the ordinary brown amphibole present.

A light colored augite is the most prominent bisilicate. It forms an important part of the whole rock. The crystals are usually surrounded by a border of secondary hornblende. Occasional scales of biotite are associated with the other dark constituents. Magnetite is more abundant than in the red quartz syenite.

Apatite crystals are here larger and more plentiful also.

Other Quartzitic Rocks

In places along the coast east of Red Sucker, this eruptive passes into a dark dioritic rock, with more basic plagioclase and very few grains of quartz. Indeed, within this body there appears to be evidence of the same differentiation as in the other rocks of the area.

A somewhat different type of quartz syenite is found on the shores of the northwest bay on Pic island, and on the mainland to the north. In color it varies from red and pink to brown and grey. It is fine to medium grey with more or less porphyritically developed feldspars.

Under the microscope they are seen to be made up of quartz, microperthite, hornblende, magnetite, and some pyrite and hematite.

The quartz is characterized by angular polyhedral forms, being the last constituent to crystallize.

The feldspar is a microperthitic intergrowth of orthoclase and albite, and makes up the bulk of the rock. Well developed euhedral crystals are common. Carlsbad

twins are numerous. The potash feldspar is not always the chief part of the crystal, for the plagioclase frequently predominates. All intermediate stages are found. Inclusions are very numerous, chiefly hematite, although both magnetite and hornblende are plentiful. The hematite is often aggregated in considerable quantities, and in places practically displaces part of the feldspar. As a rule these aggregations occur along the cleavage cracks.

Deep green hornblende in irregular scales and broken up crystals, sometimes poikilitically intergrown with the feldspars, is the chief colored mineral.

Fragments of biotite sparingly occur in association with the hornblende. Magnetite, some pyrite and, in certain varieties, limonite are found, besides a few crystal fragments of fluorite, and secondary calcite.

A rather curious quartz syenite occurs about half a mile west of Coldwell station, along the railroad track. It has the general appearance of an ordinary red syenite until closely examined, when it is seen that the feldspar has a rather curious structure. It is made up of a greenish grey variety often enclosed in lens-shaped masses in a brick red variety. This at once suggests the Rapikevi structure. The red variety is perhaps the more plentiful of the two.

Under the microscope it is seen that the inner kernel is also composite, being made up of ordinary orthoclase and plagioclase, probably oligoclase, pegmatitically intergrown. The twinning lamellae show very indistinctly, making an absolute diagnosis of the feldspar rather difficult. The red feldspar which surrounds this inner kernel is partly microcline, and partly oligoclase. Magnetite, hornblende, and biotite inclusions are numerous.

Ordinary hornblende is the chief dark colored mineral. Brown biotite is usually associated with the hornblende. Magnetite, leucoxene and pyrite are present in subordinate quantities, with the former predominating. Apatite is commonly associated with the dark colored minerals in great quantities. Angular fragments of quartz are sparingly scattered throughout the rock. Calcite is more plentiful than the quartz, commonly occupying the greater part of the space filled originally by hornblende crystals.

Granites

The least important rocks of the area mapped are the granites which occur in the neighborhood of the Little Pic river. This river, which is only about a chain wide at its mouth, is the only stream in the district which can be explored by means of a canoe. It is shallow throughout. On both sides of it abrupt hills, 150 to 200 feet above the lake level, parallel the stream. In the lower stretches of the river it flows at the foot of these hills, but to the north the river valley broadens, and beyond the portages mentioned below it becomes quite extensive. The hills on the east side of the stream are lower, and for the most part farther back from the river banks. About two miles from the lake shallow rapids are encountered, which continue with few interruptions for the next four miles, making canoeing difficult. Two short portages on the east are cut past the heaviest part of these rapids. Beyond this, according to the Indians met in the neighborhood, many miles of quiet water obtain, leading to numerous small lakes in the granite country, as indicated on the map of the Geological Survey accompanying the reports of Wilson and Collins. The lower part of the river passes through red hornblende syenites, which are succeeded one and one-half miles from its mouth by granites. These granites, with one small interruption of syenites, obtain continuously from here north as far as explored, and, as shown by the report of Collins mentioned, are the beginning of an extensive area of granites and granitoid gneisses.

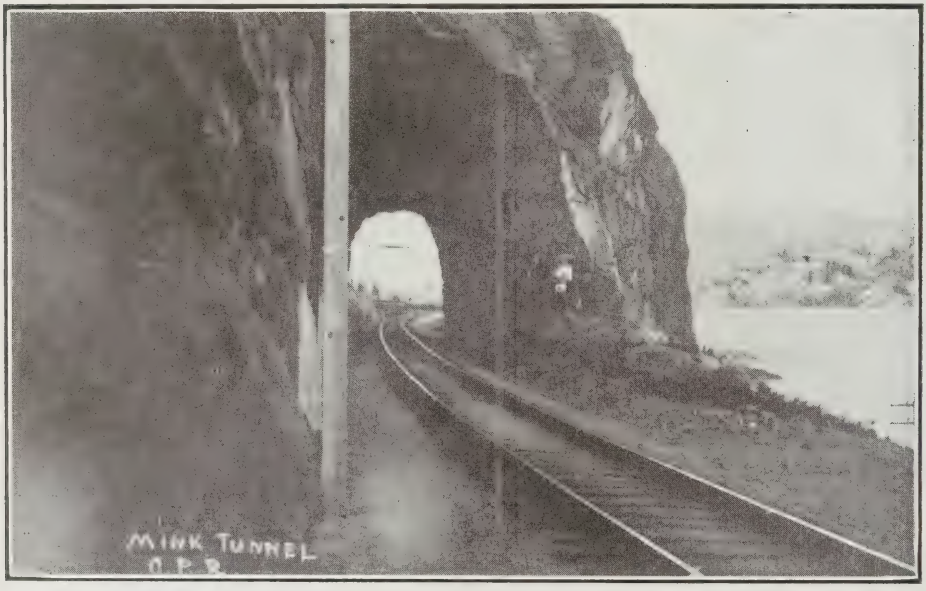
The granites are medium grained rocks, varying in color from dark red to dark grey, with some varieties pale pink to white in hue. They consist essentially of feldspar and quartz, with very little ferro-magnesium minerals. The feldspar is generally a microperthite intergrown similar to that found in other rocks in this region. However, in some of the granites oligoclase, with a very little orthoclase, makes up the bulk of the rock. All the rocks of this type are characterized by the small proportion of dark

minerals which they carry. In some, small scales and irregular fragments of hornblende associated with magnetite sparingly occur. In such rocks hematite is found in large quantities as an inclusion in the feldspar; pyrite also exists in some of the types. In the lighter colored rocks biotite, with very little iron ore, appears to be the only dark constituent. The biotite, however, never has the deep chestnut brown color seen so frequently in the syenites already described. Quartz is the last mineral to crystallize; it forms a large part of the whole rock, but possesses no unusual characteristics worthy of note here.

So far as seen on the hurried trip up the river, the syenites pass insensibly into the granite.

Chief Basic Rocks of the Region

A short distance west of Red Sucker and between the quartz syenites and the nepheline syenites, is a small area occupied by a darker basic rock resembling gabbro. It extends south of the track nearly to the mouth of Red Sucker bay, while to the north it is the chief rock on both sides of that part of the bay cut off by the railroad, with an



Mink Tunnel, Lake Superior.

unknown extent to the north of this. From a little west of Mink tunnel it follows the shore line, as indicated on the map accompanying this report, to Coldwell harbor, and from the harbor with interruptions of nepheline syenite along the east side of Coldwell peninsula to its southeast projection, besides occupying most of the several small islands between Detention island and the mainland. A considerable area of the rock is found on the west side of the peninsula, as well as in the interior of this same region, as seen on the two lines explored from Pic channel.

Somewhat different rocks of the basic variety occur in the line explored north of Munro bay, beyond the syenites. Between Mile Post 78 and the Little Pic river, a still more basic type approximating true picrite is found, while just east of Middleton station a small body of olivine gabbro occurs.

Besides these particular sections, small bodies of basic rock are found associated with the other rocks of the region in many places which cannot be detailed here.

In numerous localities, especially east of the Little Pic along the railway track, and south of this in the interior of Coldwell peninsula, brecciated masses of these basic rocks are found where subsequent eruptives have carried off angular blocks of the older rocks, forming an interesting example of an eruptive breccia.

Wherever found they are seen to be older than any other rocks with which they are associated, and are undoubtedly the oldest rocks of the massif. Small dikes of associated eruptives pierce it in all directions.

Along the lake front in the neighborhood of Coldwell harbor wave action has honeycombed the rock by wearing away the less resistant constituents. In this respect it is very different from any other member of the association, as wave erosion in all other cases has produced rounded, smooth surfaces; in many instances, particularly among the dark syenites, preserving the roches moutonnées effect left by the glaciers. In the more exposed sections along the lake front small dikes of the more resistant acid rocks project a foot or more above the surrounding basic rock.



Gabbro, near Middleton.

The more common type, as seen in the neighborhood of Coldwell, is a holocrystalline, granitic, dark grey rock of medium texture, with gleaming outstanding crystals of biotite, and the dark minerals making up more than three-fourths of the whole.

Near the contact with the other rocks the composition varies greatly at times, due to the incorporation of some of the basic rock by the later more acid eruptives. For instance, where it approaches the red augite syenite the rock possesses a reddish tinge, and where the nepheline rocks are in contact it is distinctly lighter in color, giving rise to a small extent of intermediate types. This is not always true, however.

Composition of the Basic Rocks

Under the microscope the rock is seen to be composed of augite, olivine, biotite, hornblende, magnetite, plagioclase (Labradorite), some orthoclase, occasionally nepheline, and large quantities of magnetite, with apatite as the chief accessory mineral. While these constituents, with the exception of orthoclase and nepheline, are found in nearly all the sections, their relative amounts vary very greatly. For instance, some of the rock in the neighborhood of Coldwell harbor has very little plagioclase present, and is really a typical picrite, while again the constitution is that of a true olivine gabbro. In the neighborhood of Red Sucker parts of the mass have the composition of an essexite.

Augite is always the chief mineral present. It is usually in idiomorphic crystals, with the faces (100), (010) and (110) well developed. It is mostly of a pale green color, and faintly pleochroic. But in certain of the rocks near Red Sucker deep green diopside occurs similar to that of the nepheline syenites.

In some sections of the rock from near Red Sucker it is associated with considerable biotite, which occasionally is seen forming an interrupted border about the pyroxene, or included in the crystal itself. Zonal structure was observed in a few cases. Sometimes the outer edge of the augite has been changed into hornblende. The chief inclusions are apatite in large, clear crystals, magnetite, with very little pyrite, and biotite. Besides, certain sections from near Red Sucker, as well as that near Middleton, have innumerable small dark crystallites, probably ilmenite, arranged parallel to steep terminal planes, with a tendency to segregation in the centre of the crystals. Such sections have a distinct violet tinge. In many cases the pyroxene is practically free from inclusions.

Olivine is the next most important constituent, and is always present. It is usually colorless, but occasionally green, and almost invariably it occurs in irregular anhedra. Ordinarily it is rather fresh, but all stages of decomposition are found, from the thin fringe of serpentine surrounding the central crystal to the completely changed mass, where the olivine has been replaced by the resulting magnetite, serpentine and chlorite. Innumerable crystallite inclusions are frequently met, and are probably ilmenite. Iddingsite as a secondary mineral was seen in one place as fine parallel fibres about the exterior of the crystal.

Splendid examples of reaction rims about the olivine are found in many of these basic rocks. The inner rim consists of small crystal fragments of a colorless mineral possessing high double refraction. These are arranged more or less normally to the outer edge of the olivine. The mineral itself is probably tremolite. Outside of this a wider rim of deep green biotite is usually found. While these biotite fragments ordinarily are also arranged perpendicular to the outer edge of the olivine, yet occasionally crystals arranged at right angles to this are seen. The boundary between the tremolite and biotite is always sharply defined, but the biotite itself runs out irregularly into the surrounding feldspar.

Besides these two minerals, certain sections of olivine were observed which were perfectly fresh, but with a rather wide border of magnetite inside of the tremolite and biotite.

These reaction rims were not noted excepting where the olivine was originally in contact with the feldspar. Where olivine and augite were together, no reaction rim was noted.

Biotite is a most important constituent of these rocks. It appears under the microscope in large sections of irregular outline. The color varies from deep red brown, dark brown, brownish yellow, to pale yellow. It is strongly pleochroic in shades of the same color. It is usually subordinate in amount to olivine or augite, but in a specimen of essexite obtained just east of Red Sucker tunnel it is the most important mineral present. It has a very small optic angle, not more than 2° or 3°.

Ordinary brown hornblende was found in a few of the sections studied near Red Sucker, but it is frequently entirely wanting, and is by far the least important of all the colored minerals.

Serpentine and chlorite as secondary minerals are generally present in large amounts, associated with the olivine or augite.

In most cases plagioclase is the only colorless constituent present, with the exception of apatite. However, orthoclase and nepheline are found in greatly subordinate proportions in certain places near the nepheline syenites, both near Red Sucker and along the west side of the big peninsula.

The plagioclase occurs in xenomorphic to hypidiomorphic tabular fragments, occupying the interspaces among the more basic minerals. It is usually quite fresh. Besides the regular albite twinning, Carlsbad twins are common in some sections, while twin-

ning, according to the Manebach law, is also present. The feldspar is chiefly labradorite, but some anorthite is also found. Occasionally there is a more or less zonal growth of the one about the other, the more basic occupying the centre of the crystal.

Orthoclase in anhedral grains is not an important constituent, but is present in those rocks which carry nepheline. Nepheline in polyhedral fragments is found in certain rocks, both to the east and west of the main nepheline syenite. Numerous large crystals of apatite are always associated with the dark minerals. Magnetite in large irregular grains is an important mineral, and is chiefly associated with the other dark minerals. Pyrite is sparingly present in some of the sections. Epidote as a secondary product from the plagioclase was seen in some of the sections studied.

As mentioned above, the composition of different parts of this basic rock warrant different names. In the neighborhood of Red Sucker, and the western part of Coldwell peninsula, certain sections studied have the composition of essexites. None of the specimens resemble very closely any of the essexites the writer has seen from Norway, but there is a marked resemblance to a specimen in the University collection from Pommerle, Bohemia. A more careful study of the region would undoubtedly disclose essexite as a much more important part of the massif than at present known.

On certain of the little islands between Detention and the mainland the rock is a true picrite, being composed almost entirely of augite, olivine, and magnetite with very little feldspar. Picrite also occurs along the railway track east of the Little Pic river.

Just east of Middleton the chief basic rock is an ordinary olivine gabbro.

Diorite

About four miles and a half north of Munro Bay, along the line explored in that region, there appears to be a considerable area of fine grained biotite diorite. The same rock occurs about three miles and a half north of Coldwell station, and is undoubtedly part of the same body, as sections of rocks from the two localities are identical. In both places they are cut by the surrounding syenites. This diorite is composed of ordinary green hornblende, brown biotite, numerous crystal fragments of sphene, and a little magnetite and feldspar.

The only exceptional feature of any of these minerals is the prevalent zonal structures of the feldspars. Most of these consist of an outer border of albite with the innermost part of the crystal anorthite, with intermediate members of the series between, as indicated by the extinction angles.

In the neighborhood of Munro Bay a considerable body of fine-grained basic rock, which is difficult to place in relation with other members of the massif, is found. It is extremely fine textured, and has much the appearance of compact basalt. When seen along the railway track it is badly broken up by joint fissuring, and along the parting planes hematite has been developed in places to such an extent that the rock has much the appearance, upon first view, of an iron ore. Where it approaches the red quartz syenites the rock has a distinct reddish shade of color. Dikes of the syenite cut it in all directions, proving it to be the older of the two.

Under the microscope the following minerals are made out: Hornblende, magnetite, epidote and feldspar. Green hornblende seems to be decidedly the most important constituent. It occurs in microscopic grains and crystal fragments.

Epidote appears as if filling in cavities from which the original mineral has been displaced. It is readily recognized by its pleochroism and high polarization colors.

Plagioclase is partly idiomorphic and partly xenomorphic. Owing to the innumerable inclusions, the crystals are so clouded that their exact determination was impossible.

The feldspar is chiefly a matrix in which the other constituents are imbedded.

The chemical composition of this fine-grained basic rock places it among the more basic eruptives. The analysis was made by E. L. C. Forster, M.A., of Toronto University.

SiO_2	49.49
Al_2O_3	16.67
TiO_2	1.45
Fe_2O_3	4.35
FeO	12.71
MnO	0.35
CaO	3.98
MgO	2.21
K_2O	2.61
Na_2O	4.75
H_2O	1.51
	100.08

The Younger Dike Rocks of the Area

Besides the coarse grained pegmatitic developments found in all the rocks of the region, and already referred to, and the small off-shoots of the younger rocks found penetrating the older, numerous small dikes of later eruptives cut the massif in all directions. To describe these in detail would carry us too far, but for the sake of completeness a brief summary of the chief characteristics may be noted.

Pegmatitic Veins

One of the most noticeable features of all the rocks described, and particularly of the nepheline syenites themselves, is the great number of small veins of coarse-grained pegmatite which cut the body of the rock. These veins in the nepheline syenites vary from less than one inch to a foot or more in width, with the smaller veins greatly preponderating. They appear to be composed essentially of the same constituents as the body of the rock itself. They are not always found with well-developed borders, but pass gradually from the coarse-grained type found in the centre of the dike to the finer textured body of the rock.

The small quantity of dark minerals is a rather constant characteristic of these veins. The best development of the hydronepheline spreustein is always seen here, its bright orange red color making it the most conspicuous feature of the rock. It is here, too, that the feldspar crystals reach their greatest development. Hornblende, augite and biotite also sparingly occur. It is altogether likely that these veins represent the last stages of cooling in the rock.

Similar pegmatitic veins, consisting largely of feldspar, are found both in the red hornblende syenite and the augite syenite.

True Dike Rocks

Most of the dikes of the region are small, ranging from a couple of inches to four feet in width, with an occasional dike larger than this. In the field most of these dike rocks appear to be closely related in composition. This is borne out by a microscopic study. They are chiefly dark slate grey in color, and very fine-grained; some, however, are made up of slightly reddish colored rock. The larger dikes are intermediate in texture between the fine-grained dikes and the coarser country rock. Some show more or less porphyritic developments of different minerals. For the most part these dike rocks would be classed in the field as greenstones. Many of them are intermediate in composition between camptonites and essexites. It would be unprofitable to describe them in detail here.

Camptonites

The camptonites make up the principal dikes of the area. They are composed chiefly of hornblende, biotite and feldspar, magnetite, some pyrite, very little apatite, and secondary calcite. None of these minerals, however, possess any unusual characteristics worthy of note. The rocks are often uniformly fine-grained, but frequently phenocrysts of different minerals are found. These phenocrysts vary in different dikes;

sometimes they are composed of hornblende, in other parts augite, always in a fine-grained ground mass, consisting chiefly of plagioclase. Again, the rock is more uniformly of an intermediate texture, with the individual crystals of the various constituents of about equal size. The feldspar at times possesses a more or less ophitic texture. Hornblende is usually the most abundant mineral.

Dikes differing from these in the presence of olivine, which is usually replaced by calcite and chlorite, are quite common.

A rather interesting dike occurs cutting the red syenite near Mile Post 77. It is one of the larger dikes in the region, being about six feet wide. It is of intermediate texture and pale red color, and is composed of dark brown barkevikite, a very little biotite, deep blue riebeckite and feldspar. The feldspar is the chief constituent, and occurs in part in rather well-developed crystals, and partly as a fine granular material. It is made up of microperthite and albite. Besides this, a few grains of magnetite and fluorite are present. Quartz occurs sparingly. The chief interest attached to this particular dike is that it is the only place in the district where the deep blue pleochroic riebeckite was found in any quantity. This amphibole forms probably one-tenth of the rock. It is always in poorly developed crystal forms.

About a mile inland from Pic channel, on the most easterly line explored through the Coldwell peninsula, a rather interesting dike was found. The most prominent constituent in it is rather fresh olivine. In one place this olivine showed a fine development of the hour-glass structure. Usually a great deal of magnetite is associated with the olivine. Besides olivine, biotite in irregular fragments scattered throughout the rock, and almost colorless anhedra of augite together with basic plagioclase, more or less ophitically developed, make up the rock.

A small vein of rather pure natrolite was found west of Mink tunnel.

A number of fine-grained diabase dikes are also found, but they possess no features worthy of discussion here.

Relative Ages of Members of the Massif

According to Brögger, the rocks of the Norwegian nepheline syenite area were derived from a common magma basin through a succession of eruptions, beginning with the basic rocks and forming a continuous series to the most acid granites. He also states his belief that the later basic dikes found cutting the main rock mass represent the final depletion of the original magma basin.[15]

While the data obtained in the Coldwell district are most incomplete, and therefore unsatisfactory upon which to theorize, yet in some respects Brögger's conception of the origin of the Christiania rocks seems to hold true here.

Unquestionably the oldest rocks of this eruptive series are the basic picrites, gabbros, etc.; while it is just as true that the youngest rocks of the region are the narrow basic dikes.

In the neighborhood of Coldwell, and in two or three places on the Coldwell peninsula in particular, wherever coarse-grained basic eruptives were found, off-shoots and dikes of the associated rocks invariably pierce them. Several good examples of eruptive breccias occur towards the western part of Coldwell peninsula, where large blocks of the basic rocks were carried off by the later more acid eruptives; therefore there need be no hesitation in placing these basic rocks as the oldest members of the massif.

Next in age to the basic series Brögger places the laurvikites. The same age relations appear to hold for the Coldwell area. Wherever relationships were observed, however, between the augite syenites and the red hornblende syenites, off-shoots of the latter were found cutting the former. If we look upon this red hornblende syenite as a more or less variant type of the laurvikite (for everywhere they grade into one another), the two rocks would take up the same relative position in age as is found in South Norway. Off-shoots of these are found cutting the more basic rocks, while they are themselves pierced by dikes of the undoubtedly later nepheline syenites.

[15] Zeitschrift für Kryst. u. Min. Band 16, 1890, pp. 80-90.

Brögger has determined that his laurdalites are younger than the laurvikites, and older than all the succeeding acid rocks, including the ackerite, nordmarkite and granites. Similarly in the Port Coldwell massif the various types of nepheline syenite are younger than the augite and hornblende syenites. Off-shoots from the main nepheline syenite mass are always found penetrating the older basic rocks, the red hornblende syenite, or the laurvikite associated with it.

It is true also, as has already been pointed out, that innumerable transition types are found between the distinct nepheline syenites and the true hornblende syenites; also between the true hornblende syenites and the laurvikites, and in the main body of each individual rock a great deal of differentiation has taken place, giving rise to a number of variant types. But the evidence of the relative ages of the three main rocks is amply conclusive.

Brögger places his ackerite and nordmarkite next in age to the laurdalites, with the granites the youngest of all, excepting the later dike rocks. While I am inclined to think the same holds true for the Port Coldwell area, yet my data are not by any means complete. It is true that small dikes of quartz syenites were found cutting the laurvikite, and, as mentioned in an earlier part of this paper, certain rocks closely resembling the augite syenites have a composition intermediate between it and some of the quartz syenites of the region.

Only one dike containing quartz as an essential constituent was found in the whole region cutting the nepheline syenites. In the quartz syenites themselves, small dikes made up of more than 50 per cent. of quartz are found piercing the main body of the rock. One would almost be inclined to think, however, from their appearance that instead of these being off-shoots from later more acid types, they merely take the place in the quartz syenites of the pegmatitic contemporaneous veins described for the nepheline syenite. However, what little evidence we have seems to point to the quartz syenites as being younger than the true syenites, thus placing them in the same relative position as Brögger's nordmarkites. As for the granites, as has been stated, no age relations were noted, but it is not improbable that when a more detailed investigation of the region is made it will be found that they, too, hold a corresponding position to Brögger's granites and granitites.

However, the evidence collected appears to support the theory that the syenite massif fades into the more acid rocks to the north without any sharp line of demarcation. While, therefore, the age relationships of the various rock types of this petrological province seems to closely follow similar relations in the south Norway region, yet there is reason to think that the whole syenite massif merely represents a peripheral differentiation phase of the fundamental gneiss found to the north. The writer is constrained to this opinion not only by what was seen in the Pic river country, but also by the general appearance and nature of the feldspar in the associate granites which so closely resemble the feldspars of the syenites, as well as the fact that in the northern part of the area visited quartz occurs in both the hornblende and augite syenites much more frequently than in the southern part of the area.

In many of the nepheline syenite areas of the world limestones, or rock containing considerable quantities of lime, are found associated with them. This has led Prof. Daly of the Massachusetts Institute of Technology to formulate a theory which accounts for the presence of nepheline syenites on the assumption that large quantities of limestone were absorbed in the molten magma and conditions developed which made the solidification of nepheline syenite possible.[16]. As far as the Port Coldwell area is concerned, no limestone rocks of any type were found associated with these syenites, so that if Prof. Daly's theory holds, any remnants of such rock must have been carried away by the ice during the glacial period. The only calcium carbonate found in any of the rock occurs as a minor constituent in the rocks themselves, as given in the description which fills the foregoing pages.

[16] See Prof. Daly's paper, read before the Geological Section of the American Association for the Advancement of Science, at Cambridge, Mass., 1909.

Economic Value of the Port Coldwell Rocks

It has been shown by J. Francis Williams that certain of the nepheline syenites and associated rocks of Arkansas are very valuable for building purposes, both because of their durability and their appearance. Many very fine structures have been erected with the so-called blue granite (pulaskite) and other rocks found in the Fourche mountains. Extensive tests were made with those rocks under the direction of Mr. Williams, which proved that they compared favorably for building purposes with the best granites and syenites from any part of the world.[17]

One of the most beautiful rocks in the world for monumental purposes, and for facings of public buildings, is the famous laurvikite of Norway. Large quantities of these rocks are shipped annually to the British Isles, and different countries on the Continent for those purposes. It is also exported to Canada and the United States for monumental purposes.



Bridge over the Little Pic river. The abutments are constructed largely of laurvikite.

There is no doubt that some of the varieties of rock found in the Port Coldwell district would lend themselves admirably to similar purposes. This is particularly true of the dark laurvikite, which occurs so extensively in the neighborhood of Peninsula.

As stated before, most of the rock seen was finer textured than the Norwegian laurvikite, which is used for commercial purposes, yet it is very probable that more extensive explorations would disclose areas of a much coarser rock, which would perhaps be more readily marketable, but even the finer-grained types of this rock would make excellent building material. The dark color of the more typical rock, together with the marked porphyritic development of the feldspars and their dark bluish schiller, gives it great possibilities for the future. The fact that it occurs so close to the lake, and that Peninsula Harbor is perhaps one of the best harbors on that part of the north shore, should make the problem of transportation to the large centres a comparatively simple one.

[17] *Vide* Annual Report of the Geological Survey of Arkansas for 1890, Vol. II.

The C.P.R. have a quarry just a little west of Peninsula from which they have taken a considerable amount of this rock for building abutments for bridges. In the construction of the bridge over Little Pic river, rock from this quarry was used.

Besides the laurvikites, there are certain types of the nepheline rock which would also supply splendid building material. Much of this rock containing the orange red spots of hydronepheline spreustein would supply excellent decorative material, particularly for inter-mural purposes. The light colored nepheline syenites occupying the high hill on Pic island should also find a ready market in the future, and indeed almost every type of rock in the region, including the red syenite and some of the quartz syenites, should prove a valuable asset for the district.

In the neighborhood of Port Coldwell is a rather excellent type of red syenite. An attempt has apparently been made to quarry this rock just back of the little fishing village and between the C.P.R. tracks and the bay.

It might require some searching to locate sections of any of these rocks well adapted for quarrying, but no doubt judicious exploration would result in finding many such places in the area described.

End of Part I.

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1. Route map of parts of the Moose River Tributaries, Districts of Algoma, Sudbury and Nipissing, accompanying report by M. B. Baker on "Iron and Lignite of the Mattagami Basin." Scale: 4 miles to an inch.

2. Sturgeon Lake Gold Field, geologically colored, District of Thunder Bay, by E. S. Moore. Scale: 40 chains to an inch.

3. Silver Mountain Area, geologically colored, District of Thunder Bay, by N. L. Bowen. Scale: 1 mile to an inch.

4. Vermilion Lake Pyrite Deposits, geologically colored, District of Rainy River, by E. S. Moore. Scale: 40 chains to an inch.

LETTER OF TRANSMISSION

To His Honour John Morison Gibson, Etc., Etc., Etc.,

Lieutenant-Governor of the Province of Ontario:

Sir,—I have the honour to transmit herewith for presentation to the Legislative Assembly of the Province of Ontario, the Twentieth Annual Report of the Bureau of Mines.

I have the honour to be, Sir,
Your obedient Servant,

F. Cochrane,
Minister of Lands, Forests and Mines.

Department of Lands, Forests and Mines.
Toronto, 27th February, 1911.

INTRODUCTORY LETTER

To The Honourable Frank Cochrane,
Minister of Lands, Forests and Mines.

Sir,—I beg to hand you herewith to be presented to His Honour the Lieutenant-Governor in Council, the Twentieth Annual Report of the Bureau of Mines, comprising two parts.

The Report covers, speaking generally, the year 1910, but where information pertaining to the period elapsing between the close of the year and the publication of the Bureau's annual volume is available, it has always been the practice to make use of it. In 1909 the fiscal year of the Province was made to end on the 31st day of October, and the statements of revenue given in the Bureau's Reports since that time have been for the fiscal instead of for the calendar year as formerly. Statistics of production, however, continue to be for the twelve months ending 31st of December.

Part I. of the Report opens with the usual statistical review of the Province's mining industry for the preceding year. Tables are given showing the output in quantity and value of the various metals and mineral substances, with corresponding figures for preceding years, so that comparisons may be made, and the rate of progress, or the reverse, noted. The aggregate production for 1910 much exceeded that of any former year, the gain in value over 1909, previously the record year, being upwards of six millions of dollars. The silver mines of Cobalt, which have placed Ontario in the position of the third largest producer of silver in the world, increased their output by four and three-quarter millions of ounces, and the nickel mines of Sudbury, now recognized as the most important source of this metal, by 5,495 tons. Other important products, both metallic and non-metallic, show considerable advances, and while there have been a few decreases, the production tables on the whole give evidence that the mining industry of Ontario is undergoing a steady and rapid growth. The field, too, is widening. The yield of gold has never been great in this Province, and it has at times seemed as if gold production was about to cease entirely. Developments at Porcupine, however, afford good ground for hoping that Ontario will yet make an appreciable contribution to the gold output of the Dominion.

The revenue derived by the Government from mining sources is now considerable. In 1910, it amounted to $941,030.09, and tables are given showing the items of which this total is composed. Particulars are also presented regarding the mining companies incorporated and licensed during the year, the work of the Provincial Assay Office, Mining Recorders, etc., and there are tables of fatal and non-fatal accidents. Mr. E. T. Corkill, Chief Inspector of Mines, deals with the whole subject of mining accidents, among other things indicating the directions from which a much-needed improvement over the present state of things may be expected to come.

Mr. Corkill describes the Mines of Ontario, and gives details concerning the development work in the various properties as noted by him in his visits of inspection for the purpose of seeing that the regulations for the safety and health of mine employees, provided by the Mining Act of Ontario, are duly observed. The silver mines of Cobalt are not dealt with by Mr. Corkill, as these will be covered by the fourth edition of Dr. W. G. Miller's Report on the Silver Districts of Ontario, the publication of which has been somewhat delayed. This Report will be Part II. of the Nineteenth annual volume.

A number of years ago silver mining was actively carried on in the region west of Port Arthur, but of late little or nothing has been done there, and most of the mines have been long idle. The interest aroused by the silver camps of northeastern Ontario—Cobalt, Gowganda, etc.—has led to more or less inquiry regarding the older field, and the prospects of re-opening some of the properties formerly productive, or of discovering new deposits. Mr. N. L. Bowen was commissioned to re-examine and report upon the area, and his observations are published in Part I. under the heading "Silver in Thunder Bay District," the report being illustrated by a geologically colored map.

Mr. Bowen has also compiled some useful notes on the Salt Industry of Ontario, and briefly describes the processes employed in the procuring and manufacturing of that article.

As Cobalt has stimulated interest in the old silver mines of Ontario, so have the gold discoveries at Porcupine given rise to a demand for information regarding the older gold districts of the Province, the Bureau's Reports dealing with which are for the most part out of print, The Sturgeon Lake Gold Field was visited by Dr. E. S. Moore, in 1909, and again in 1910, and the Gold Fields of Lake of the Woods, Manitou and Dryden in the latter year by Mr. Arthur L. Parsons. Their respective reports will be found in Part I. and are accompanied by geological maps.

Dr. Moore also reports on the Iron Pyrite Deposits at Vermilion Lake, near the line of the Transcontinental railway, and not far from Lake Minnietakie. Some of these deposits have recently been developed, and from their size, and the quality of the ore, are likely to provide shipments on a considerable scale. As an appendix, Dr. Moore makes a short report on the Tip Top Copper mine, near Round Lake.

Newspaper reports having again alleged the discovery of bituminous coal on the Hudson Bay slope, Prof. M. B. Baker, of Queen's University, Kingston, was asked to investigate them. The results of this exploration are embodied in Prof. Baker's Report on Iron and Lignite in the Mattagami Basin. The finds proved to be of lignite of the kind which has long been known to exist in that region, the usefulness of which is likely to be confined to the locality in which the deposits occur. Prof. Baker at the same time examined the iron ore deposits at Grand Rapids on the Mattagami river, discovered by Dr. Robert Bell in 1875, and his report thereon will be found of interest. Owing to the over-burden of earth on the river banks, the dimensions of these deposits have not been definitely ascertained, but they are apparently of importance. Prof. Baker regards them as due to the oxidation of siderite of Animikie age, which he believes to exist at many other places along the edge of the Paleozoic coastal plain. He points out that the siderite which is exceptionally high in quality, might itself be used as an iron ore.

Prof. W. G. Miller, Provincial Geologist, contributes to Part I., Notes on a Geological Trip in Scotland, and makes an instructive comparison between the Pre-Cambrian formations of the Scottish Highlands and those of Ontario. A notable difference is that whereas the Pre-Cambrian of Ontario is pre-eminently mineral-bearing, in Scotland it is apparently barren of economic minerals.

Dr. Miller and Mr. Cyril W. Knight, Assistant Provincial Geologist, treat briefly of the Laurentian System, and particularly of the banded gneisses and their geological relationships.

Mr. S. Price, Mining Commissioner, deals with the Mining Law of Ontario, on which he is well qualified to speak. Mr. Price gives a historical sketch of the various regulations and statutes preceding the present law, and a thorough exposition of the latter, which will be found useful to prospectors, legal practitioners and others, to whom an accurate acquaintance with the Mining Act is necessary.

Part II. contains a description of the geology and mineralogy of the Porcupine Gold Area, by Mr. A. G. Burrows, of the Bureau's Geological staff. Mr. Burrows' Report is accompanied by a geologically coloured map of the Porcupine Gold Area with copious marginal notes, on a scale of one mile to an inch, and also by a map showing the geology of part of the territory lying between Porcupine and Gowganda.

In Part II. there is also a description of the Alexo Nickel deposit on lot 1, in the third concession of Dundonald township, by Mr. E. L. Uglow.

I have the honour to be, Sir,

Your obedient servant,

THOS. W. GIBSON,

Deputy Minister of Mines.

DEPARTMENT OF LANDS, FORESTS AND MINES,
Toronto, 27th February, 1911.

REPORT OF THE BUREAU OF MINES 1911

VOL. XX PART I

STATISTICAL REVIEW

By Thos. W. Gibson, Deputy Minister of Mines

Returns to the Bureau of Mines under the Mining Act of Ontario show that the products of the mines and mineral works of the Province for the twelve months ending 31st December, 1910, had a value of $39,313,895. For 1909 the value was $32,981,375, the increase for the year being thus $6,332,520, or over 19 per cent. As compared with 1908, the increase was $13,676,278, or 53 per cent.

During the last few years, the advance in production has been very marked, as the following figures make plain:—

Year.	Value of Production.
1905	$17,854,296
1906	22,388,383
1907	25,019,373
1908	25,637,617
1909	32,981,375
1910	39,313,895

The only year during this period which did not show a substantial gain over its predecessor was 1908, when there was a slackening in the rate of progress, due to a lessened output of nickel, pig iron, Portland cement and petroleum. The total increase during the term was 122 per cent.

Previous to 1905, the non-metallic list provided the larger share of the production, but owing to the very decided developments in silver and nickel, the metals have come to be responsible for nearly three-fourths of the entire value, the proportions in 1910 being, metals 72 per cent., non-metals 28 per cent. Metals rose from $10,201,010 in 1905 to $28,161,678 in 1910, and non-metals from $7,653,286 to $11,152,217.

For 1910 all the metallic products, save cobalt, iron ore and zinc ore, show an increased output as compared with 1909, the principal advances being in silver, $3,016,600, nickel, $1,215,163, copper, $247,088, pig iron, $673,890. In non-metals, brick (common) shows an excess of $458,140, stone of $301,396, Portland cement of $246,995, and natural gas, $303,060. Drain tile fell of $45,106, pressed brick, $31,975, and petroleum, $191,325. The items contributing most largely to the output for the year were, silver, 39 per cent., pig iron, 17 per cent., nickel, 10 per cent., Portland cement, 8 per cent., brick, 7 per cent., natural gas, 4 per cent., copper, 3 per cent. The remainder, say 12 per cent., was provided by 24 other products, largely non-metallic.

Development of the Mining Industry

The tables which follow exhibit the mining industry in its various departments, and afford opportunities for studying its development. The statistician is rarely justified in venturing on the realm of prophecy, but the upward tendency of the curve described by the growth of mining in Ontario points strongly to still greater things in the future. It can hardly be doubted that the extension of prospecting into northern Ontario, now being rendered possible through railway construction, will bring to light new mineral fields probably as rich as any that have yet been found. The discovery of one such field leads almost as by a law of nature to the discovery of others. Silver

Islet led to Rabbit Mountain and Beaver; Copper Cliff and Stobie to Creighton and Crean Hill and Garson; the Helen mine to the Josephine and Magpie; Sultana to Mikado; Cobalt to South Lorrain and Gowganda, and latest of all to Porcupine. Nor do the pre-Cambrian formations possess a monopoly of mineral wealth; the Devonian and Silurian strata of southwestern Ontario have for years yielded goodly supplies of petroleum, natural gas, salt and gypsum. Petroleum may be declining in production, but that there are reservoirs, great or small, yet untouched, seems to be shown by the striking of oil in paying quantities a short time ago in Onondaga township, and the field for profitable production of natural gas appears to be steadily widening until it promises to cover a large part, if not the whole, of the northern and eastern shores of lake Erie. These stratified rocks have their counterparts on the slope leading down to James bay. Already gypsum in large deposits has been located there, and it would seem not unreasonable to entertain the hope that the future inhabitants of the clay belt north of the height of land may find it possible to light their homes with oil, cook their food with natural gas, and cure their pork with salt, all derived from the rocks underlying the farms from which they harvest their crops.

Table I. contains a summary of the mineral production for 1910, and in addition gives the number of employees engaged in mining or making the several products, and the sums paid them as wages. It should be borne in mind, in using these figures, that they have reference to the mines and plants actually engaged in the work of production, and do not include labor and wages expended in casual or preliminary work.

Table I.—Mineral Production of Ontario, 1910

Product.	Quantity.	Value.	Employees.	Wages.
Metallic:		$		$
Gold.....ounces	3,619	68,498	319	257,411
Silver..... "	30,651,417	15,481,322	3,317	2,973,772
Cobalt.....tons	1,098	54,699		
Nickel..... "	19,140	4,005,961	2,210	1,723,365
Copper..... "	9,630	1,374,103		
Iron ore..... "	230,656	513,721	561	315,537
Pig iron..... "	447,351	6,975,418	2,120	1,484,233
Zinc ore..... "	576	5,760	23	7,400
....	....	28,479,482	8,550	6,761,718
Less Ontario iron ore (143,284 tons) smelted into pig iron	....	317,804	....	.....
Net metallic production.....	....	28,161,678	....	.....
Non-metallic:				
Actinolite.....	32	320	.....	.....
Arsenic, refined.....tons	1,524	70,709	.....	.....
" crude..... "	3,373	.....	.....	.....
Brick, common.....No.	304,988,000	2,374,287	3,262	1,234,855
Tile, drain..... "	21,028,000	318,456		
Brick, pressed..... "	44,204,295	458,596	297	188,896
" paving..... "	3,799,0 5	70,648		
Building and crushed stone.....	.....	761,126	876	364,914
Calcium carbide.....tons	3,072	184,323	56	37,630
Cement, Portland.....bbl.	2,471,837	3,144,343	1,233	713,550
Corundum,.....Tons	1,870	171,994	201	100,945
Feldspar..... "	16,374	47,518	107	34,901
Fluorspar..... "	2	15	5	327
Graphite..... "	992	55,637	70	40,687
Gypsum..... "	10,043	17,825	52	5,062
Iron pyrites..... "	33,812	98,353	227	117,191
Lime.....bush.	2,889,235	474,531	400	177,975
Mica.....tons	513	85,294	128	47,162
Natural gas.....	.....	1,491,239	186	118,785
Peat.....tons	851	1,284	29	3,500
Petroleum.....Imp. gal.	11,004,357	368,153	428	280,485
Pottery.....	.....	51,485	40	16,878
Quartz.....tons	90,685	87,424	92	49,382
Salt..... "	84,071	414,978	202	114,056
Sewer pipe.....	.....	357,087	210	110,106
Talc.....tons	5,824	46,592	37	15,252
Add metallic production.....	.....	11,152,217	8,138	3,770,539
.....	.....	28,161,678	8,550	6,761,718
Total production.....	....	39,313,895	16,688	10,532,257

The increase or decrease in the output of the several products is shown in Table II. which follows, the comparison being between the years 1910 and 1909:—

Table II.——Comparative Value Mineral Production, 1909 and 1910

Product.	1909.	1910.	Change. (I) Increase. (D) Decrease.	
Metallic:	$	$		$
Gold	32,445	68,498	I	36,053
Silver	12,464,722	15,481,322	I	3,016,600
Cobalt	94,965	54,699	D	40,266
Nickel	2,790,798	4,005,961	I	1,215,163
Copper	1,127,015	1,374,103	I	247,088
Iron ore	645,622	513,721	D	131,901
Pig iron	6,301,528	6,975,418	I	673,890
Zinc ore	8,950	5,760	D	3,190
Non-metallic:				
Actinolite		320	I	320
Arsenic	61,039	70,709	I	9,670
Brick, common	1,916,147	2,374,287	I	458,140
" pressed	490,571	458,596	D	31,975
" paving	73,700	70,648	D	3,052
Building and crushed stone	660,000	761,126	I	101,126
Calcium carbide	151,676	184,323	I	32,647
Cement, Portland	2,897,348	3,144,343	I	246,995
Corundum	140,817	171,994	I	31,177
Feldspar	36,204	47,518	I	11,314
Fluorspar		15	I	15
Graphite	37,624	55,637	I	18,013
Gypsum	23,604	17,825	D	5,779
Iron pyrites	78,170	98,353	I	20,183
Lime	470,858	474,531	I	3,673
Mica	73,124	85,294	I	12,170
Natural gas	1,188,179	1,491,239	I	303,060
Peat	240	1,284	I	1,044
Phosphate of lime	1,904		D	1,904
Petroleum	559,478	368,153	D	191,325
Pottery	43,214	51,485	I	8,271
Quartz	75,329	87,424	I	12,095
Salt	389,573	414,978	I	25,405
Sewer pipe	311,830	357,087	I	45,257
Talc	8,700	46,592	I	37,892
Tile, drain	363,550	318,456	D	45,094

For several years past the figures of production given in these Reports have been re-cast on the basis adopted by the Mines Department at Ottawa, in order to facilitate comparisons between the statistics presented by that Department and the Bureau respectively, and to enable the importance of this Province's mining industry to be more clearly seen. The difference between the methods of computation employed lies in the fact that while the several products are by the Bureau valued at their selling price at point of production, the Mines Department uses the price at which the refined article sells in the ruling market. This difference is confined to the metallic substances, the non-metallic products being valued by both at the place and in the form produced. For instance, the copper mined in Ontario, which comes mostly from the nickel-copper ores of the Sudbury district, is represented in the Bureau's tables at the value placed upon it by the mining companies themselves as a component of the Bessemer matte turned out by their converters, this being the highest stage of refinement attained in the Province. On the other hand, the Mines Department assumes the copper in the matte to be worth the price of refined metallic copper in New York, and values the output in its statistics accordingly. It is obvious that such a method will impute a much greater value to unrefined or partly refined substances than the one employed by the Bureau, and it is to meet the situation thus created that the Bureau's figures require to be presented in the alternative form. It should also be noted that in dealing with pig iron, the Mines Department includes only that made from Canadian ores, thus taking no account of the product of imported ore, from which is made the bulk of the pig iron produced in Canada.

Treating the figures of production for 1910, as per Table I. according to the methods of the Department of Mines, the following results are obtained:—

Table III.—Value Mineral Production, 1910, "Mines Department" Basis

Product.	Quantity.	Price.	Value.
Gold	oz. 3,619	$18.94 per oz.	$ 68,498
Silver	" 30,651,417	53.486 cents per oz.	16,394,217
Cobalt	tons 379 (a)	$144.32 per ton	54,699
Nickel	" 18,636 (b)	30 cents per lb.	11,181,600
Copper	" 9,630	12.738 cents per lb.	2,453,339
Pig iron	" 77,961 (c)	$15.50 per ton	1,204,210
Iron ore	" 80,354 (d)	$2.23 per ton	179,189
Zinc ore	" 576	$10.00 per ton	5,760
		Total	31,541,512
Value non-metallic production per Table I.			11,152,217
Gross value production			$42,693,729

(a) Cobalt ore only paid for by smelters. (b) Contents Sudbury mattes only.
(c) Proportion pig iron from Ontario ore. (d) Exports only.

Taking the mineral production of the Dominion of Canada as given by the Department of Mines in its Preliminary Report for 1910 at $105,040,958, the output of Ontario is thus shown to have been nearly 41 per cent. of the whole, or the same proportion as for the preceding year, 1909. In metals only, the increased yield of silver and nickel have of late years placed Ontario in the position of producing more than all the other Provinces put together. Last year her mines provided over 64 per cent. of the total metalliferous production of Canada.

The following table shows the progress, or the reverse, made in the various branches of the mining industry during the five years beginning with 1906:—

Table IV.—Mineral Production, 1906 to 1910

Product.	1906.	1907.	1908.	1909.	1910.
Metallic:	$	$	$	$	$
Gold	66,193	66,399	60,337	32,445	68,498
Silver	3,689,286	6,157,871	9,136,830	12,464,722	15,481,322
Platinum, Palladium	5,652	.....	.....	.....	.....
Cobalt	80,704	92,751	111,118	94,965	54,699
Copper	960,813	1,045,511	1,071,140	1,127,015	1,374,103
Nickel	3,839,419	2,271,616	1,866,059	2,790,798	4,005,961
Iron ore	301,032	482,532	574,839	645,622	513,721
Pig iron	4,554,247	4,716,857	4,390,839	6,301,528	6,975,418
Pig lead	93,500	.....	.....	.....	.....
Zinc ore	6,000	.....	.....	8,950	5,760
	13,596,846	14,833,537	17,211,162	23,466,045	28,479,482
Less value Ontario iron ore smelted into pig iron	243,776	282,702	456,176	537,549	317,804
Net metallic production	13,353,080	14,550,835	16,754,986	22,928,496	28,161,678
Non-metallic:					
Actinolite	.....	.....	.....	.....	320
Arsenic	15,858	40,104	40,373	61,039	70,709
Brick, common	2,157,000	2,109,978	1,575,875	1,916,147	2,374,287
" paving	45,000	73,270	61,554	73,700	70,648
" pressed	337,795	648,683	485,819	490,571	458,596
Building and crushed stone	660,000	675,000	530,041	660,000	761,126
Carbide of calcium	162,780	173,763	147,150	151,676	184,323
Cement, natural rock	6,000	5,097	.....	.....	.....
" Portland	2,381,014	2,777,478	2,417,769	2,897,348	3,144,343
Corundum	262,448	242,608	11,437	140,817	171,994
Feldspar	43,849	30,375	20,300	36,204	47,518
Fluorspar	.....	.....	.....	.....	15
Graphite	15,000	20,000	1,600	37,624	55,637
Gypsum	6,605	19,652	20,778	23,604	17,825
Iron pyrites	40,583	51,842	69,980	78,170	98,353
Lime	496,785	418,700	448,596	470,858	474,531
Mica	69,041	82,929	73,586	73,124	85,294
Natural gas	533,446	746,499	988,616	1,188,179	1,491,239
Peat fuel	900	1,040	900	240	1,284
Petroleum (crude)	761,546	1,049,631	703,773	559,478	368,153
Phosphate of lime	.....	.....	7,048	1,904	.....
Pottery	65,000	54,585	50,310	43,214	51,485
Quartz	65,765	124,148	52,830	75,329	87,424
Salt	367,738	432,936	488,330	389,573	414,978
Sewer pipe	279,620	435,088	344,260	311,830	357,087
Sodalite	6,000	.....	.....	.....	.....
Talc	3,030	5,010	3,048	8,700	46,592
Tile, drain	252,500	250,122	338,658	363,550	318,456
Total non-metallic production	9,035,303	10,468,538	8,882,631	10,052,879	11,152,217
Add metallic production	13,353,080	14,550,835	16,754,986	22,928,496	28,161,678
Total production	22,388,383	25,019,373	25,637,617	32,981,375	39,313,895

The quantity and value of the entire mineral production of Ontario from the beginning cannot now with exactness be ascertained, since the mining industry had been long in existence before any systematic collection of yearly statistics was begun. The time to procure and put on record statistical data of any kind is when the data are in the making, or immediately afterwards. If not attempted until subsequently the results are usually uncertain in proportion to the lapse of time and the scarcity of contemporary evidence. An effort was made in the Nineteenth Report[1] to present figures showing the entire output of metals and metallic ores since the opening of mines in Ontario, and on the basis of the Table there given the production is now brought down to the end of 1910. The total value as shown amounts to over one hundred and sixty-one millions of dollars, or allowing for some over-lapping due to including the figures for iron ore as well as pig iron, say one hundred and fifty-seven or one hundred and fifty-eight millions, according to the Bureau's method of valuation. If computed on the basis of refined prices, the aggregate would considerably exceed two hundred millions of dollars.

Table V.—Total Production of Metals in Ontario

Product.	Quantity.	Value.
		$
Gold ..... oz.	163,336	2,577,990
Silver ..... "	98,872,911	63,550,476
Platinum and Palladium ..... "	3,364	62,784
Cobalt ..... tons	5,215	585,470
Nickel ..... "	118,673	32,611,829
Copper ..... "	99,098	14,374,103
Iron ore ..... "	3,180,656	6,039,571
Pig iron ..... "	2,656,105	41,475,418
Lead ore ..... "	3,351	20,000
Pig lead ..... "	1,143	96,000
Zinc ore ..... "	7,704	92,410
Total	.....	161,486,051

Gold

There were nine properties from which gold bullion was recovered in 1910, the output being 3,619 ounces, valued at $68,498. This is an improvement over 1909, when the yield was 2,042 ounces worth $32,445. The producing mines were the Gilmour, in Hastings county; Havilah, formerly the Ophir, in Galbraith township, north shore of lake Huron; Canadian Exploration Company's at Long lake on the Sault branch of the C.P.R; Mikado, on Shoal lake, Lake of the Woods; Le Page and Norwalk, Michipicoten; Swastika in Otto township, T. & N. O. railway; and Hollinger and Dome, Porcupine. The Porcupine mines were responsible for more than one-half the production, small stamping outfits having been installed to treat the ore taken out during development work; better than one-quarter came from the Canadian Exploration Company's mine near Long lake, on which a deposit of arsenical ore is being opened up with promise of good results, and in a hitherto unworked field. The remainder came in scattered quantities from the other properties mentioned. One of these, namely, the Mikado, a number of years ago shared with the Sultana the leadership of the productive mines on Lake of the Woods, and is again being worked by a new company under the directions of Capt. H. A. Machin, M.P.P. During the former operations the Mikado is credited with having produced over $500,000 in gold. The Ophir or Havilah mine was opened up in 1892, the surface showings being very good. After being worked spasmodically for a number of years, it was closed down in 1902. Both the Mikado and Ophir are described in Reports of the Bureau of Mines. For the former, see volumes 6 to 13: battery statistics for 1896, 1897 and 1898 are given in vol. 8, page 22. For the Ophir particulars may be found in volumes 2 and 3.

[1] 19th Rep. B.M., 1910, pt. I., p. 9.

Interest in gold mining at present centres in the Porcupine camp. The spectacular showings of free gold found here in 1909 on the Dome, Hollinger, Bannerman, and other claims, speedily attracted a rush of prospectors, who have been and still are engaged in locating veins and staking claims. It was fortunate for the early development of the camp that the pioneer work fell largely to the lot of two groups of men of undoubted financial strength, both possessing much experience in the proving of mining properties in Ontario. One of these was composed of Messrs. L. H. and N. A. Timmins, John A. and Duncan McMartin and D. A. Dunlap, who were associated with La Rose silver mine, one of the first discovered and most famous mines of Cobalt. These men took over the Hollinger claims and have been steadily developing them since the summer of 1909 with much judgment and success. The Canadian Copper Company and allied interests furnished the second group, under whose management the Dome mines are being rapidly brought to the point of producing bullion. At the present time a 30-stamp mill is being installed at the Hollinger and a 40-stamp mill at the Dome. Water power for use at Porcupine is being developed at two points on the Mattagami river, one downstream at Sandy Falls in the township of Mountjoy, about six miles distant, by Messrs. A. M. Bilsky and H. D. Symmes; and one at Wawaitin Falls, about sixteen miles up the river, by E. A. Wallberg.

A report on the Porcupine gold field by Mr. A. G. Burrows, Assistant Provincial Geologist, accompanied by a revised and extended geological map with full annotations, is published as Part II. of this Report, and should be referred to for a description of the geology and mineralogy of the district.

The gold discoveries in the township of Munro and neighborhood, lying east of the T. & N. O. railway, have been undergoing development, and considerable machinery was placed upon some of them during the winter of 1910-11. At the Swastika mine, Otto township, work seems to have proven the existence of gold at some depth. Gold is also reported from the vicinity of Hobon, where the Algoma Central and Hudson Bay railway will join the main line of the C. P. R., but there is as yet little information concerning the occurrence here or the nature of the rock formations. The interest evoked by the Porcupine finds has extended to some of the older fields, including that of Hastings county, where the old Belmont or Cordova mine has passed into the control of Mr. P. Kirkegaard, long connected with the mining and treatment of the auriferous mispickel deposits at Deloro in the same county. It is proposed by Mr. Kirkegaard to re-open the mine, on which there is a fully-equipped 30-stamp mill ready for operation.

There was no production from Sturgeon lake. Dr. E. S. Moore completed his survey of this district last year, and his report thereon is published in this volume under the title "The Sturgeon Lake Gold Field."

Silver

The yield of the silver mines of the Province in 1910 was 30,651,417 fine ounces, the money return from which to the mining companies was $15,481,322. As compared with 1909, the output was 4,747,432 ounces, and the value $3,016,600, greater. Practically the whole of the production was from the mines of Cobalt, including in that term South Lorrain, Elk Lake and Gowganda.

The mines of Cobalt camp from the beginning up to 31st December, 1910, have added upwards of 94 million ounces to the world's stock of silver. The number of the producing mines was 39, of which 38 were at Cobalt, the remaining one being the Hanson Consolidated, the only mine in the Port Arthur silver region which returned any production last year.

The full list of the productive mines is as follows, and after the names of most is given the output for the year 1910. This is a departure from the practice hitherto followed by the Bureau in refraining from publishing the production of individual properties, and is made with the consent of the companies in question. In any event,

in the case of most mines, the figures of production are annually put in print for the information of the shareholders, so that such statistics are easily available to any one interested, and there now seems, especially in such a well-established camp as Cobalt, no good reason for withholding the figures. The list is as follows:

Mine.	Production, 1910. Oz.
Nipissing	5,590,080
La Rose (including Lawson)	3,484,754
Crown Reserve (including Silver Leaf)	3,255,567
Kerr Lake	2,877,299
Coniagas	2,621,681
McKinley-Darragh-Savage	2,606,891
Temiskaming	1,994,226
Buffalo	1,629,328
Hudson Bay	985,552
Trethewey	846,579
Right of Way	455,986
Millerett	322,000
City of Cobalt	305,216
Wettlaufer-Lorrain	199,920
Cobalt Town Site	195,597
Beaver	181,450

Other producers were O'Brien, Nova Scotia, Little Nipissing, Silver Cliff, Cobalt Lake, Chambers-Ferland, Hargrave, Colonial, Drummond, King Edward, Wyandoh, Rochester, Provincial, Waldman, Boyd-Gordon, Dobie-Reeve, Miller Lake-O'Brien, Bonsall, Lucky Godfrey, Bellellen and Casey Cobalt.

From two mines in South Lorrain, the Bellellen and Wettlaufer-Lorrain, there were shipped 233 tons of ore containing 221,233 ounces of silver, and from six in Gowganda and Elk Lake, namely, Boyd-Gordon, Dobie-Reeve, Miller Lake-O'Brien, Millerett, Bonsall and Lucky Godfrey, 480 tons, containing 481,523 ounces. The remainder was from Cobalt proper, excepting small returns from Casey Cobalt, which geographically is quite outside the recognized Cobalt area, and Hanson Consolidated, situated west of Port Arthur.

There were shipped from the mines 27,485 tons of ore and 6,874 tons of concentrates; also 980,633 ounces of bullion obtained partly by cyanidation and partly by the smelting of nuggets and metallic silver. The ore shipped contained an average of 821 ounces of silver per ton, and the concentrates 1,030 ounces; or taken together, ore and concentrates carried 863.5 ounces per ton. In 1909 the corresponding figures were: ore, 809 ounces, concentrates 1,165 ounces, per ton; or together 842.6 ounces per ton. Notwithstanding the fact that a very considerable quantity of low-grade silicious ore was shipped to such smelting points as Denver, Colorado, where it is utilized in mixing with ores of a more basic character, the general quality of the material shipped by the mines of Cobalt, as indicated by these figures, shows no symptoms of a lowering in quality. If the metallics melted down to form a part of the bullion sent out by the mines had been included in the ore, they would have still further heightened its grade.

Concentrating Low Grade Ores.

In the natural development of Cobalt the concentration of low-grade ores is yearly assuming greater importance. The first concentrates were made in 1908, amounting to 1,137 tons; in 1909 the shipments were 2,948 tons, and in 1910 they rose to 6,846 tons. Although constituting by weight only 20 per cent. of the shipments from the camp in 1910, they accounted for 23.1 per cent. of the total yield of silver. There were at work

during the year fourteen concentration plants, of which three were customs mills, namely, Northern Customs Concentrators, Nipissing Reduction Works and Montreal Reduction Company's plant at Trout Mills; and the remaining eleven were operated by as many mining companies for the treatment of their ores. A fourteenth plant, that of the Hudson Bay Mines, Limited, was under construction at the close of the year, and has since begun work.

Following is a list of the concentration plants, showing also their capacity in tons of ore per day:

Mine.	Capacity.
Buffalo	120
Colonial	30
Coniagas	175
Hudson Bay	75
King Edward	30
McKinley-Darragh-Savage	90
Nova Scotia	75
O'Brien	90
Silver Cliff	75
Standard Cobalt	75
Temiskaming	90
Trethewey	85
Custom mills:—	
Nipissing Reduction Company	40
Northern Customs Concentrators	175
Montreal Reduction Works (closed).	
Total	1,225

The actual concentration of ore throughout the year is shown in the subjoined table. The ore is credited to the mine producing it, as well when the concentration was performed at a custom plant as when at a mill owned and operated by the company itself. A few companies have expressed a wish that the details of their business should not be published except in bulk, and their wishes are respected.

Table VI.—Concentration of Silver Ore, 1910.

Name of Mine.	Ore Concentrated. Tons.	Concentrates produced. Tons.	Silver in concentrates. Ounces.	Average silver in concentrates per ton. Ounces.	Ratio of concentration.
Buffalo	39,038	969	1,154,470	1,203	40 to 1
City of Cobalt	9,367	214	201,802	943	43 " 1
Coniagas	38,709	907.1	1,318,836	1,486	42 " 1
King Edward	8,805	152.7	87,549	573	62 " 1
La Rose	32,303	809.5	585,152	783	40 " 1
McKinley-Darragh	43,279	1,922.3	1,615,468	849	22 " 1
Nipissing	13,984	328.6	381,155	1,017	42 " 1
O'Brien	25,687	211.5	351,889	1,170	.....
Temiskaming	21,683	653.1	529,099	811	33 " 1
Trethewey	19,013	236.5	400,391	1,729	80 " 1
Standard Cobalt	22,426	310.	141,458	473	74 " 1
Various other mines	31,275	300	317,471	1,058	104 " 1
Totals	305,569	7,014.3	7,084,740	Av., 1,030	Av., 43.5 to 1

The shipments of concentrates were slightly less than the production, being 6,874.6 tons as against 7,014.3, and the average silver contents per ton are, of course, based on the shipments. It will be observed that there is a wide variation, not only in the silver tenor of the concentrates, but also in the ratio of concentration. The former ranges from 473 ounces for the Standard Cobalt to 1,729 ounces for the Trethewey. In general,

it would seem that the mines situated on the conglomerate carry richer milling rock than those whose veins occur in the diabase. The little stringers or veinlets found leading into and sometimes connecting the smaltite veins in conglomerate areas as a rule partake of the nature of the parent leads and contain silver as well as cobalt, nickel and arsenic, in similar proportions. In the diabase the wall rock may be sufficiently rich to warrant its being put through the concentrator, but the silver is present chiefly in leaf form or as infiltrations, unassociated with any considerable percentages of the other minerals, and, as it would appear, generally in smaller amount than in the conglomerate.

Assuming that on an average 85 per cent. of the silver is recovered in the concentrates, the average contents of the rock milled last year were 27.2 ounces per ton. The dividing line between shipping ore and mill rock is probably about 100 ounces per ton, and as the cost of treatment is about $3.50 per ton, ore containing less than 10 ounces per ton is considered unprofitable.

Market for Ores

There is a good demand for the silver ores of Cobalt, for the higher grades as well as for the poorer, more silicious qualities which have a value for fluxing purposes apart from their silver contents. Part of the richer ore goes to smelters in New York, Pennsylvania and New Jersey, and some of the heavy metallic ore from such mines as the Crown Reserve finds its way to the works of Beer, Sondheimer and Company in Germany, but most of the high grade ore is now refined in Ontario by the Canadian Copper Company, Copper Cliff, the Deloro Mining and Reduction Company, Deloro, and the Coniagas Reduction Company, whose head office is at St. Catharines and works at Thorold. These three companies combined treated 9,466 tons of ore and concentrates in 1910, the recovery of silver from which amounted to 14,574,837 fine ounces. The remainder of the output, consisting of 24,893 tons of ore and concentrates, yielding 16,076,580 ounces of silver, was exported, mainly to the United States. The material sent abroad for treatment thus contained on an average 645 ounces per ton, while that refined at home carried an average of 1,539 ounces per ton.

In addition to the three Canadian companies mentioned, the following concerns were in the market last year for Cobalt silver ores: American Smelting and Refining Company, whose purchases of low-grade ore were sent to Denver, Col., and Omaha, Neb., and of high grade to Perth Amboy, N. J., Balbach Smelting and Refining Company, Newark, N. J., Pennsylvania Smelting Company, Carnegie, Pa., United States Metals Refining Company, Chrome, N. J., Beer, Sondheimer and Company, Frankfort-on-Main, Germany, and Quick, Barton and Company, London, England. The tariffs according to which these companies buy the ores vary a good deal in details, some imposing a refining charge of a half or three-quarters of a cent per ounce of silver, and a treatment charge of $10 or $25 per ton of ore, and paying for 95 up to 98 per cent. of the silver contents; others omitting the treatment charges, but paying for up to 95 per cent. of the silver, and subjecting nickel and arsenic to certain penalties if in excess of specified proportions. Neither cobalt, nickel nor arsenic are now paid for by ore-buyers.

Three new companies have erected plants for treating cobalt silver ores in Ontario, and expect to be in the market for the purchase of ores. These are Dominion Metals, Limited, Toronto, Canada Refining and Smelting Company, Orillia, and Swansea Smelting and Refining Company, Swansea.

The facilities for handling ore in the Cobalt camp were increased in 1910 by the establishment of a sampling plant by Messrs. Campbell and Deyell. The works have a capacity of 30 tons of high grade ore per day, and are proving of much convenience to the mines. Without the aid of a sampling plant, it is a difficult matter to estimate closely the contents or value of a carload of such irregular material as high grade silver ore from Cobalt, but by ascertaining the contents in advance of sale or shipment, the seller is enabled to choose the market for which his ore is best suited. The advant-

ages will be still more apparent when the sampling and assay come to be accepted as authoritative by smelters and buyers generally.

The operations of the Canadian cobalt-silver smelting works for the year 1910 may be summarized as follows:—

Ore received	9,506	tons
Ore treated	9,466	tons
White arsenic recovered and shipped	3,047,699	pounds
Value of ditto	$70,709	
Cobalt oxide shipped	13,508	pounds
Value of ditto	$9,630	
Mixed oxides of Cobalt and nickel shipped	108,178	pounds
Value of ditto	$18,769	
Silver recovered	14,574,837	ounces
Value of ditto	$7,656,098	
Workmen employed	298	
Wages paid	$212,694	

From the time the mines of Cobalt were opened in 1904 down to 31st December, 1910, the production of silver has been as shown in the following table:—

Table VII.—Silver Production, Cobalt Mines, 1904 to 1910

Year.	Producing Mines.	Shipments.			Silver Contents.			Ave'ge Silver Contents per Ton.		Value of Silver Shipments.			Total Value.
		Ore,	Concentrates	Bullion.	Ore,	Concentrates,	Bullion,	Ore.	Concentrates.	Ore,	Concentrates,	Bullion,	
	No.	Tons.	Tons	oz.	oz.	oz.	oz.	oz.	oz.	$	$	$	$
1904	4	158	.....	.....	206,875	.....	.....	1,309	.....	111,887	.....	.....	111,887
1905	16	2,144	.....	.....	2,451,356	.....	.....	1,143	.....	1,360,503	.....	.....	1,360,503
1906	17	5,335	.....	.....	5,401,766	.....	.....	1,013	.....	3,667,551	.....	.....	3,667,551
1907	28	14,788	.....	.....	10,023,311	.....	.....	677	.....	6,155,391	.....	.....	6,155,391
1908	30	24,487	1,137	.....	18,022,480	1,415,395	.....	736	1,244	8,468,293	665,085	.....	9,133,378
1909	31	27,729	2,948	.....	22,436,355	3,461,470	.....	809	1,174	10,809,872	1,651,704	.....	12,461,576
1910	41	27,437	6,845	980,633	22,581,714	7,082,834	980,633	821	1,030	11,360,489	3,590 098	527,460	15,478,047
Tl..	..	102,078	10,930	980,633	81,123,857	11,959,699	980,633	795	1,094	41,933,986	5,906,887	527,460	48,368,333

The record is one of steady and rapid progress, not easily matched in the annals of the mining industry in any part of the world. Cobalt has given Ontario third place among silver-producing countries, coming next after Mexico and the United States. The estimated production of the world in 1910 as given by the Director of the United States Mint was 217,788,714 ounces, Mexico being credited with 72,574,220 ounces, and the United States with 56,438,695 ounces. The production of Canada is given in the Director's table as 32,878,590 ounces, which is a close approximation to the actual figures, Ontario's output being 30,651,417 ounces, per Table I., and British Columbia's 2,500,000 ounces as stated by Mr. Wm. Fleet Robertson, Provincial Mineralogist of that Province in his preliminary estimate of mineral production for 1910, issued in January, 1911. South America, whose silver mines once united with the golden ingots of the Incas to fire the imagination and arouse the cupidity of her Spanish conquerors, yielded in 1910 only 16,476,928 ounces, while Australasia furnished about the same quantity, or 16,359,284 ounces. That is to say, Ontario's silver product last year was almost as great as that of South America and Australasia combined. It may not be out of place to show the sources at present supplying the world's requirements of silver, which is being poured forth from her mines at a rate never equalled before. The figures are those put out by the United States Mint.

Silver Production of the World

Country.	Production in 1910. Fine ounces.		Proportion of whole output. Per cent.
Mexico	72,574,220		33.3
United States	56,438,695		25.9
Canada	32,878,590		15.1
South America	16,476,928		7.6
Central do	2,294,272		1.0
Total America		180,662,705	82.9
Germany	5,332,901		
Spain	4,767,091		
Austria-Hungary	999,184		
Greece	829,025		
Italy	786,620		
France	673,302		
Great Britain	618,429		
Russia	158,546		
Norway	213,122		
Sweden	29,373		
Servia	10,230		
Turkey	7,971		
Total Europe		14,425,794	6.6
Australasia		16,359,284	7.6
Japan	4,798,351		
Dutch East Indies	465,980		
Total Asia		5,264,331	2.4
Africa		1,076,600	0.5
Total		217,788,714	100.0

These figures show that the world depends upon America for silver. This continent, including both North and South America, furnishes 82.9 per cent of the whole, Australasia 7.6 per cent., Europe 6.6 per cent., Asia 2.4 per cent., and Africa 0.5 per cent. In gold the position is quite different. The mines of the Rand give the dark continent first place in the list, her total of $175,000,000 for 1910 being more than the yield of the United States and Australasia combined, though less than the united output of the whole of America and Australasia.

It is at first sight remarkable that notwithstanding the great reduction in the price of silver per ounce as compared with 40, 30, or even 20 years ago, production goes on at a constantly accelerated rate. Thus in 1871 the world's product was 63,317,014 ounces, in 1881, 79,020,872 ounces, in 1891, 137,170,919 ounces, in 1901, 173,011,283 ounces, and in 1911 217,788,714 ounces. In 40 years the annual output has increased nearly 3½ times, and this in face of the fact that in 1871 the price was $1.326 per ounce, in 1881, $1.138 per ounce, in 1891, $0.988 per ounce, in 1901, $0.589 per ounce, and in 1910, $0.534 per ounce. The explanation doubtless is that to a very considerable extent silver is now in reality a bye-product, being a constituent of ores which are raised for the sake of other metals. For instance, in the mining of gold, copper, lead and mixed ores of other kinds, a proportion of silver is present, and is recovered in the process of treatment. The mines of Cobalt are not of this class, silver being practically the only element of value. The unceasing demand for gold would of itself necessitate the production of a very considerable quantity of silver, and copper and lead being prime requisites in the arts and industries of civilization, the flood of silver is likely to continue, even at the existing low level of values, since the market price is not the predominant factor in determining the supply. The richness of the ores of Cobalt, however, is such as to enable the mines to be worked to great advantage at the present time, and many of them would continue to produce were silver half its present price, though of course profits would suffer very materially.

Prices and Markets for Silver

The average price of silver in 1910 per fine ounce in the New York market was 53.486 cents, being nearly 2 cents higher than last year. The market opened in January at 52.375 cents and dropped in March to the lowest point in the year, namely, 51.454 cents, recovered in April to 53.221 cents, went up to 54.150 cents in July, fell to 52.912 cents in August, touched the highest figure for the year, 55.635 cents, in November, and closed in December at 54.428 cents. The fall in March is attributed to the action of the government of India in raising the import duty on silver, from 5 per cent. *ad valorem* to fourpence per ounce, the change coming into force 25th February. The controlling influence on the price of silver is the demand in Eastern Asia, particularly in India and China. In fact, it may be said that the bazaars of India determine the value. If rains are abundant and crops good, the peasants of India make a brisk market for silver, in which metal they have from time immemorial been accustomed to invest their savings, chiefly in the form of ornaments. If times are bad they cease to buy, or buy less largely; and when famine presses they are forced to part with some of their reserves. The drainage of the world's silver system leads to India, and year by year vast quantities are absorbed by the people of that country, which are never again brought to market. China, too, for the purposes of her unwieldy currency system, if system it can be called, requires considerable quantities of silver, and was an important buyer in 1910. Indian and Chinese speculators, however, are as prompt to take advantage of a turn in the market as are those of London or New York, and transactions between bulls and bears in the East do not always imply actual deliveries any more than they do in the West. The world's mart, or rather clearing house, for silver is London, whence about $35,000,000 worth was exported to India in 1910 and $7,500,000 to China. About $7,500,000 additional was sent to China direct from San Francisco. The bullion produced at Cobalt and the several refining works in Ontario goes to London.

At the close of 1910 the prospects were for a good demand and consequently sustained or even better prices for silver. Crops were good in India, except cotton, also in China, where a new and important item of agricultural produce in the shape of Soya beans has begun to figure largely in the exports. The Chinese government has resolved upon the introduction of a uniform system of silver currency to replace the present chaotic condition caused by the local variations in the weight and value of the tael, and proposes to borrow some £10,000,000 for the purposes of this necessary reform. It is thought that the new scheme will have a beneficial effect upon the price of silver. The use of silver in the arts is increasing, and apart from household ware and decorative purposes, an appreciable quantity is required in preparing sensitive plates in photography, and when so used, unlike tableware and ornaments, the silver is not recoverable and disappears entirely. The governments of India, Germany, Russia and some other countries are likely to be purchasers of silver for coinage purposes in 1911, and altogether the outlook is for fair prices in the immediate future, though the day of $1.20 or $1.30 per ounce for silver is not likely to return. On the basis of last year's production the rise or fall of one cent per ounce in the price of silver makes a difference of over $300,000 to the mine-owners of Cobalt.

Labor and Health

The operating silver mines employed 3,020 men, but this number does not include miners and laborers engaged in prospecting or assessment work on mining claims, or in testing properties not brought to the productive stage. There was paid out to these men in wages the sum of $2,761,078. On the average the mines were in operation almost 300 days during the year, or practically full time, hence the average rate of wages per employee works out at about $3.00 per day. Skilled miners and machinemen, etc., command higher figures, but muckers and laborers get less. The supply of labor was ample in the mines of Cobalt, and there were no disturbances of any kind during the year.

The silver refineries gave employment to 298 men who received in wages $212,694.

The health of the Cobalt camp was good, and there was no recurrence of the typhoid epidemic which scourged the district in 1909.

Cobalt, Nickel and Arsenic

In the table given below (page 18) are presented statistics of the total production of the mines of Cobalt, including cobalt, nickel and arsenic as well as silver. Owing to the fact that nickel and arsenic have ceased to bring any return to the producers, and cobalt last year only when in excess of six per cent., few or no assays are made of these constituents, and it is impossible to do more than estimate the actual output. Though not paid for, nickel and arsenic are not wholly or even largely lost, and it may be taken for granted that a large proportion of both, as well as of cobalt, ultimately find their way into use in the arts. The arsenic is recovered at all three of the Canadian refineries now in operation, and the new ones are also designed to save it. Where the percentage is small, as in some of the low grade ores, doubtless it goes to waste. The same is true of nickel, but where the cobalt is present in sufficient quantity to warrant its recovery, the nickel is obtained at the same time.

Some pains have been taken to determine, if possible, the actual production of cobalt, nickel and arsenic from the mines of Cobalt, but it cannot be claimed that absolutely certain results have been reached. Probably, however, the figures are not far from the truth. The difficulty in obtaining precise information lies in the fact that the mining companies receive nothing for the nickel and arsenic contents of their ores, and only on rare occasions anything for the cobalt. In consequence they have no incentive to ascertain with anything like accuracy the quantities of these elements contained in their shipments, and make few or no assays for the purpose. From the smelting companies at Copper Cliff, Deloro and Thorold, however, have been obtained statistics covering their entire operations up to the end of 1910, giving the quantity of ore treated, and the contents of the same not only in silver, but also in cobalt, nickel and arsenic. These show that the three plants had put through a total of 28,013 tons of ore, practically all high grade, and concentrates, the contents of which were 49,709,321 ounces of silver, 1893.95 tons of cobalt, 1042.69 tons of nickel, and 8404.34 tons of arsenic. The proportions of the several constituents were: Silver, 6.084 per cent. (1774.5 ounces per ton); cobalt 6.76 per cent.; nickel, 3.72 per cent., and arsenic 30 per cent. That is to say, for every 1 per cent. of arsenic there were present .225 per cent. cobalt, and .124 per cent. nickel.

The facts are much less easy of ascertainment with regard to the ores exported, mainly to the United States, for treatment. It may be taken for granted that the high grade ore and concentrates exported will carry the same proportions of cobalt, nickel and arsenic as like material treated at home, but much of the exports were of low grade, and it is difficult to obtain definite information respecting the percentages present of the three subsidiary elements. The total quantity of ore and concentrates exported was 24,876 tons, containing 16,076,580 ounces of silver. The average silver contents were therefore 646.2 ounces per ton, as compared with 1,774.5 ounces per ton yielded by the material treated by the Canadian smelters.

It would be a short cut to a result to assume that the entire mineralization of the exported ore was on the same scale as for the silver alone, and that consequently the cobalt, nickel and arsenic contents per ton of the exported material would bear the same proportion to those of the ore treated at home as does the silver in the latter ores. The ratio would then be 646.2 to 1,774.5.

Arsenic the Governing Factor

It is obvious, however, that the real key to the situation is the arsenic, not the silver. The cobalt and nickel are both in chemical combination with the arsenic, while the silver is largely in the metallic form, or if in compounds, the combination is

chiefly with sulphur instead of with arsenic. Hence, the proportion of silver, though no doubt some indication of the proportion of the other substances, cannot be regarded as a definite guide. On the other hand, while it is true that the ores of Cobalt contain a variety of minerals carrying arsenic and cobalt and arsenic and nickel, differing from one another in the percentages of the respective elements, it is not a violent assumption that one year with another, and one mine with another, the proportion of arsenic to cobalt and to nickel will remain approximately uniform.

Data are not entirely wanting with regard to the arsenic contents of the low grade ores smelted in the United States. The United States Metals Refining Company of New York, whose works are at Chrome, N. J., smelted up to 31st December, 1910, 10,462 tons of Cobalt ore averaging 221.3 ounces of silver and 2.87 per cent. of arsenic. The American Smelting and Refining Company at their Denver, Col., works up to the same time smelted 28,097 tons containing an average of 184.3 ounces of silver and 4.19 per cent. of arsenic. Thus, these two companies found an average of 3.82 per cent. of arsenic in 38,559 tons of ore, whose silver contents averaged 194.4 ounces per ton. Assuming that the proportion between arsenic on the one hand, and cobalt and nickel on the other, was the same in these low grade ores as in the high grade material treated by the Ontario smelting companies, 3.82 per cent. of arsenic would imply the presence of .833 per cent. of cobalt, and .458 per cent. of nickel.

If, then, the arsenic contents of the entire production at Cobalt were known, we could arrive at a fairly close approximation of the cobalt and nickel output; but this factor in the problem is wanting. Say, however, that of the 27,437 tons of ore shipped out in 1910, in addition to the concentrates, one-fourth was high-grade, and three-fourths low-grade. This would give 6,859 tons of the former and 20,578 of the latter. Adding the concentrates, 6,845 tons, to the high-grade ore, we have 13,704 tons of material containing 6.76 per cent. cobalt, 3.72 per cent. nickel, and 30 per cent. arsenic; and 20,578 tons containing, as we have assumed, .833 per cent. cobalt, .458 per cent. nickel, and 3.7 per cent. arsenic. The yield of the several substances would, therefore, be:—

	Cobalt. Tons.	Nickel. Tons.	Arsenic. Tons.
High-grade ore, etc.	926.39	509.78	4,111.20
Low-grade ore, etc.	171.41	94.24	786.07
Total	1,097.80	604.02	4,897.27

or for the entire product of the mines for 1910, namely, 34,282 tons of ore and concentrates, an average of 3.20 per cent. cobalt, 1.47 per cent. nickel and 14.28 per cent. arsenic. For arsenic the figures are practically the same as were assumed in last year's Report, namely, 14 per cent., but are somewhat lower for cobalt and nickel, the assumed percentages being then 5 and 2½ per cent. respectively.

Table VIII.—Total Production, Cobalt Mines, 1904 to 1910.

Year.	Shipments, ore and concentrates.	Nickel.		Cobalt.		Arsenic.		Silver.		Total Value.
	Tons.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Ounces.	Value.	
			$		$		$		$	$
1904.....	158	14	3,467	16	19,960	72	903	206,875	111,887	136,217
1905.....	2,144	75	10,000	118	100,000	549	2,693	2,451,356	1,360,503	1,473,196
1906.....	5,335	160	.....	321	80,704	1,440	15,858	5,401,766	3,667,551	3,764,113
1907.....	14,788	370	1,174	739	104,426	2,958	40,104	10,023,311	6,155,391	6,301,095
1908.....	25,624	612	.....	1,224	111,118	3,672	40,373	19,437,875	9,133,378	9,284,869
1909.....	30,677	766	.....	1,533	94,965	4,294	61,039	25,897,825	12,461,576	12,617,580
1910.....	34,282	604	.....	1,098	54,699	4,897	70,709	30,645,181	15,478,047	15,603,455
Total ..	113,008	2,601	14,641	5,049	565,872	17,891	231,679	94,464,189	48,368,333	49,180,525

Note.—The production of 1910 includes 980,633 ounces bullion.

Dividends

The dividends paid or declared by silver mining companies at Cobalt during 1910, amounted to $7,275,239.90, and for the period ending 31st December, 1910, to $21,802,179.58. These sums do not include the very considerable profits made by private individuals or close corporations in the operation of their own properties, including the Drummond and O'Brien mines. If these sums were taken into the account, it would probably be found that the total dividends would be at least $25,000,000, or more than 50 per cent. of the gross receipts from the mines. A table of the dividend-paying companies is given on page 20, from which it will be seen that several have now returned to the shareholders dividends equalling the entire share capital, and others are rapidly approaching this point. A few companies, notably the Nipissing Mining Company, Limited, and Kerr Lake Mining Company, Limited, whose capital is given as $250,000 and $40,000 respectively are really only operating companies for larger organizations capitalized, the former at $6,000,000, and the latter at $3,000,000. In the case of the Nipissing, even the $6,000,000 and more has been paid back in dividends.

Last year the annual statements of four of the leading mines at Cobalt, namely, Nipissing, Crown Reserve, Kerr Lake and Coniagas, were summarized with the view of affording a nearer view of the operations and financial results of these splendid properties. Similar data for the succeeding year is given below, and La Rose and McKinley-Darragh-Savage mines are also included in the list.

Nipissing

The income from ore sold during the year and value of ore at mine in transit and at smelters, 31st December, 1910, was $2,984,084.19, other income from ground rents, etc., $52,668.85, total $3,036,753.04. Cost of mining and all other expenses amounted to $869,649.54, leaving a profit on the year's production of $2,167,103.50, in addition to surplus at 1st January of $913,195.46. After paying dividends in 1910 amounting to $1,672,500 and providing for January, 1911, dividend, $455,000, the net surplus carried forward was $952,798.96. Shipments were as follows:—

Material.	Dry Tons.	Net Value per Ton. $	Gross ounces Silver.	Net Value. $	Per cent. of Total Value.
High Grade Ore	1531.792	1,317.51	3,999,580.48	2,018,152.21	73.6
Low Grade Silicious Ore	4834.3315	88.34	1,008,357.79	427,069.68	15.6
Concentrates	319.12	456.90	296,490.55	145,805.27	5.3
Nuggets	13.6865	11,054.25	293,349.79	151,294.07	5.5
Total	6698.93	(*av.*) 409.37	5,597,778.61	2,742,321.23	100.0

The average assay of the shipments was: High grade ore 2,611.04 ounces silver, 9.35 per cent. cobalt and 6.72 per cent. nickel per ton; low grade silicious ore 208.58 ounces silver; concentrates 929.08 ounces silver, 6.46 per cent. cobalt and 2.68 per cent. nickel; nuggets 21,433.51 ounces silver per ton. Based on a production of 6,717.26 tons ore and concentrates, containing 5,548,651.91 ounces silver, the cost of production worked out at $0.1472 per ounce, as per the following table:—

		Per ounce silver.
Mine operation	$492,224 05	$0.0887
Concentration	45,872 95	0.0083
Depreciation	32,325 22	0.0058
Marketing ore	279,169 61	0.0503
Corporation, New York office and travelling expenses	20,057 71	0.0036
	$869.649 54	$0.1567
Less rents and interest	52,668 85	0.0095
Total cost of production	$816,980 69	$0.1472

Statement of Dividends Paid by Silver Cobalt Mining Companies

Name of Company.	Date of Incorporation.	Authorized Capital.	Capital Stock issued.	Par value per share.	Amount of Dividends and Bonuses declared to end of 1909.	Amount of Dividends and Bonuses declared during 1910.	Total of Dividends and Bonuses declared to Dec. 31, 1910.	Last Dividend or Bonus.	
								Date declared.	Rate per cent.
		$	$	$	$ c.	$ c.	$ c.		
Buffalo Mines, Limited	April 27, 1906	1,000,000	1,000,000	1.00	637,000.00	370,000	1,007,000.00	Dec. 5, 1910.	13
City of Cobalt Mining Company, Limited	Oct. 5, 1906 / Jan. 7, 1909.	500,000 / 1,500,000	1,500,000	1.00	139,312.42		139,312.42	April 15, 1909	3
Cobalt Central Mines Company	Dec. 13, 1906	5,000,000	5,000,000	1.00	192,845.00		192,845.00	Aug. 25, 1909	1
Cobalt Silver Queen, Limited	April 1, 1906	1,500,000	1,500,000	1.00	315,000.00		315,000.00	Dec. 31, 1908	3
Coniagas Mines, Limited	Nov. 26, 1906	4,000,000	4,000,000	5.00	1,160,000.00	240,000.00	1,400,000.00	Nov. 1, 1910	3
Crown Reserve Mining Company, Limited	Jan. 16, 1907	2,000,000	1,999,957	1.00	1,591,932.60	1,061,288.40	2,653,221.00	Dec. 31, 1910	15
Foster Cobalt Mining Company, Limited	Feb. 14, 1906	1,000,000	915,588	1.00	45,000.00		45,000.00	Jan. 1, 1907	5
Kerr Lake Mining Company, Limited	Aug. 15, 1905	40,000	40,000	100.00	1,590,000.00	1,368,000.00	2,958,000.00	Dec. 13, 1910	370
La Rose Mines, Limited	Feb. 21, 1907	6,000,000	6,000,000	1.00	1,415,000.00	630,000.00	2,045,000.00	Dec. 10, 1910	2¾
McKinley-Darragh-Savage Mines of Cobalt, Limited	April 17, 1906	2,500,000	2,247,692	1.00	583,429.98	561,879.50	1,145,309.48	Nov. 14, 1910	15
Nipissing Mining Company, Limited	Dec. 16, 1904	250,000	250,000	100.00	4,355,000.00	2,127,500.00	6,482,500.00	Dec. 10, 1910	188
Right of Way Mining Company, Limited	July 13, 1906	500,000	499,518	1.00	324,643.93		324,643.93	Oct. 1, 1909	6
The Right of Way Mines, Limited	Sept. 11, 1909	2,000,000	1,685,500	1.00	33,710.00	134,840.00	168,550.00	Dec. 31, 1910	2
Temiskaming and Hudson Bay Mining Company, Ltd	July 29, 1903	25,000	7,761	1.00	1,171,911.00	162,981.00	1,334,892.00	Nov. 12, 1910	300
The Hudson Bay Mines, Limited	July 16, 1909	3,500,000	2,875,022	1.00		143,751.00	143,751.00	Nov. 11, 1910	1
Temiskaming Mining Company, Limited	Nov. 16, 1906 / Jan. 1, 1908	2,500,000	2,500,000	1.00	509,156.25	275,000.00	784,156.25	Dec. 10, 1910	8
Trethewey Silver Cobalt Mine, Limited	May 30, 1906	1,000,000	1,000,000	1.00	461,998.50	200,000.00	661,998.50	Dec. 21, 1910	10
Total						7,275,239.90	21,802,179.58		

The profit on production amounted to 72.62 per cent. of the value. Up to 31st December, 1910, there had been shipped from the mine 21,560 tons of ore and concentrates, containing 18,345,238.78 gross ounces silver, and a gross value including cobalt, nickel and arsenic paid for of $10,432,198.20, the net value received from the smelters being $9,438,908.30. In dividends a total of $6,012,500 had been paid. The reserves of developed and partly developed high-grade ore amount to 6,552,880 ounces silver, exclusive of milling rock on the dump and in the mines. The capital stock of the Nipissing Mines Company, the holding concern, is $6,000,000, and of the Nipissing Mining Company, the operating company, $250,000. The property covers 846 acres, of which 429 acres are classified as in the conglomerate formation, 176 in the Keewatin, and 241 in the diabase.

Crown Reserve

Ore production for the calendar year 1910 yielded the Crown Reserve Mining Company, Limited, the sum of $1,754,824.27. Mining and all other expenses, including development, depreciation, etc., amounted to $282,736.35, smelters' charges and deductions to $124,107.61, bonus to employees to $11,760.00, and royalty to Ontario Government (10 per cent. on value of ore at pit's mouth) to $154,119.41, leaving a profit of $1,185,100.90. Out of this were paid four quarterly dividends of 6 per cent., with 9 per cent. bonus added to each, making 60 per cent. in all, total $1,061,288.40. The surplus in Profit and Loss account at 31st December was $659,986.51. There were produced and shipped during the year 3,248,196 ounces of silver; up to the end of 1910 the mine had yielded 9,081,475 ounces of a gross value of $4,757,330.97. The company's capital stock is $2,000,000, and $2,653,221 in all were returned in dividends up to the end of 1910. The cost of producing silver was 11.97 cents per ounce. The characteristic ore of this mine is high grade, 1,637,905 pounds having been shipped during the year containing 2,958,379 ounces, or an average of 3,612 ounces per ton. Of low-grade ore 3,860,800 lbs. were sent out averaging 103 ounces per ton, and of bullion 90,041 ounces.

Kerr Lake

For the year ending 31st August, 1910, the Kerr Lake Mining Company's shipments were as follows:—

Grade of ore.	Lbs.	Silver contained. Ounces.	Average Silver contents per ton. Ounces.
First	1,311,120	2,473,128.71	3,775
Second	2,359,875	427,057.59	362
Dump	4,883,436	225,213.87	92
Total	8,554,431	3,125,400.17	

Sales of ore produced $1,528,983.34. Production and development cost $212,727.37; shipment, treatment and other charges, $115,669.79; administration and general expenses, $15,577.14, leaving a balance of profit of $1,198,220.24. There was paid in dividends $990.000. The cost of producing silver was 13.27 cents per ounce. The capital stock of the company is $3,000,000. The greatest depth at which the mine is being worked is 400 feet, on vein No. 3. The ore mined on this vein between 350 and 400 feet averaged 1,800 ounces in silver. Reserves of ore are estimated to contain from six to seven million ounces.

Coniagas

The output of the Coniagas mine for the year ending 31st October, 1910, was: from concentrates 949,901.35 ounces, from mine ore 979,629.65 ounces, total, 1,929,531 ounces. The total receipts were $1,010,413.67. The expenditure under the head of working account amounted to $256,524.69, the principal items being mining, $115,249.65, milling $40,561.08, fuel, oil and waste $25,095.85, camp expenses $15,637.93, head office

and administration $14,480.26, taxes and royalties $14,002.31. The balance, $753,888.98, was carried to Loss and Gain, and dividends amounting to $240,000 were paid, leaving a surplus of $952,402.90. From the beginning of operations to 31st October, 1910, there have been shipped from the mine a total of 5,323.1 tons of ore, containing 6,792,854 ounces of silver. The reserves are estimated as follows: Vein matter, No. 1 ore, 4,027 tons, containing 11,638,000 ounces of silver, wall rock (milling ore) 89,590 tons, containing 2,711,900 ounces, broken rock in mine (milling rock) 19,530 tons, containing 597,900 ounces, and broken ore on surface dump, 14,020 tons, containing 420,600 ounces; total 127,167 tons ore and rock, containing 15,368,400 ounces. This shows an increase of 21,167 tons ore and 2,868,400 ounces silver as compared with a year ago. The cost of producing silver is put at 13.285 cents per ounce, as compared with 15.219 cents the previous year. The capital stock of Coniagas Mines, Limited, is $4,000,000, and the company owns the stock of The Coniagas Reduction Company, Limited, at whose works, Thorold, Ontario, the ore and concentrates from the mine are treated.

La Rose

The fiscal year of La Rose Consolidated Mines, Limited, was changed to correspond with the calendar year, and the fourth annual report therefore covers only the period from 31st May to 31st December, 1910. During the seven months the shipments were:—

Material.	Tons.	Gross ounces Silver.	Net Value.	Per cent. of Total Value.
Silver-cobalt-nickel ore	901.807	1,444,259.83	722,791.09	69.44
Low grade silicious ore	913,701	146,565.04	58,759.26	5.64
Nuggets and bullion	5.620	126,761.11	66,001.57	6.34
Concentrates	559,391	400,988.17	193,382.06	18.58
Total	2,380.609	2,118,574.25	1,040,933.98	100.00

The average silver contents of the several grades were: Silver-cobalt-nickel ore 1,601.36 ounces, low-grade silicious ore 160.41 ounces, nuggets and bullion 22,555.36 ounces, and concentrates 716.83 ounces; the average of the whole being 889.93 ounces per ton. The net income for the period was $1,408,255.47, and the cost of mining and all other expenses, including smelter deductions, treatment, etc., $498,847.58, leaving a profit on production of $909,407.89. The dividends paid during the same time were $813,000.00. The cost of producing silver is given as 19.11 cents per ounce, and the ore reserves at 5,556,248 ounces of silver, of which 1,110,942 ounces are credited to the Lawson mine, and 531,650 ounces to the Princess. The total shipments to 31st December, 1910, were 20,341.18 tons, containing 10,809,885.76 ounces of silver, and a gross value of $6,027,996.67. The company's authorized share capital is $7,500,000.

McKinley Darragh-Savage

From the McKinley-Darragh mine there were recovered in 1910, 2,226,766 ounces of silver, and from the Savage mine, 412,778 ounces, a total of 2,639,544 ounces, the value of which was $1,426,856.53. The cost of production at the mines is placed at $254,794.53, of marketing the silver, $124,596.86, and of other items of outlay, $70,824.41, leaving a profit of $976,640.73, or adding receipts other than from sales of ore, $983,043.55, of which $561,879.50 was paid out in dividends. Silver was obtained from the products of the mine classified as follows:—

Material.	Tons.	Ounces silver.	Average silver contents per ton.
Nuggets	1.543	28,041	18,173.0
No. 1 Ore	439.869	974,996	2,216.5
Jig Concentrates	445.563	823,280	1,847.7
Sand do	746.229	601,418	805.9
Slime do	669.825	179,639	268.1
Miscellaneous	124.378	32,167	258.6
Total	2,427.407	2,639,541	Av. 1,087.3

The cost of silver at the McKinley-Darragh mine was 17.05 cents per ounce, and at the Savage 17.34 cents. Up to the end of 1910 there had been shipped from the former mine, 4,877,086 ounces, and from the latter 470,912 ounces, a total of 5,365,998 ounces. Ore reserves at the McKinley-Darragh are estimated at 104,450 tons, carrying, 4,894,000 ounces; and at the Savage, 31,210 tons carrying 1,147,500 ounces; or for both, 135,660 tons, with contents of 6,041,500 ounces silver. The capital of the McKinley-Darragh-Savage Mines of Cobalt, Limited, is $2,500,000.

In the following table are summarized the salient particulars of the foregoing reports. It will be seen that the average cost of producing silver in this group of mines is 16.34 cents per ounce, and that the estimated reserves of silver amount to over 40,000,000 ounces, not including the Crown Reserve, the nature of whose property makes it more than usually difficult to reduce any estimate to definite figures. It is apparent that if the view taken of their properties by these companies is correct, there is still a reasonably long life ahead of the Cobalt camp, leaving out of account altogether the large number of other producing properties not included in the list, and the probability, which is practically a certainty, of other veins and deposits now unknown being discovered as development goes on.

Mine.	Silver produced in year.	Gross Income.	Gross Expenditure.	Net Income.	Cost of producing Silver per ounce.	Total Silver produced by mine to date.	Estimated Reserve of Silver.
	Ounces.	$	$	$	cents.	Ounces.	Ounces.
Nipissing.....	5,597,779	3,036,753.04	869,649.54	2,167.103.50	14.72	18,345,239	6,552,880
Crown Reserve...	3,248,196	1,757.824.27	572,723.37	1,185,100.90	11.97	9,081,475	not given
Kerr Lake.....	3,125,400	1,542,194.54	343,974.30	1,198,220.24	13.27	not given	6,500,000
Coniagas.....	1,929 531	1,010,413.67	256,524.69	753,888.98	13.28	6,792,854	15,368,400
La Rose.....	2,118,574	1,408,255,47	498,847.58	909,407.89	19.11	10,809.886	5,556,248
McKinley-Darragh-Savage	2,639,544	1,433.259.35	450,215.80	983,043.55	17.05	not given	6,041,500
Total.....	18,659,024	10,188,700.34	2,991,935.28	7,196,765.06	16.34	.....	.....

The Question of Power

The mines at Cobalt are now enjoying the advantages of water-power developed on the Montreal and Metabitchewan rivers, and transmitted both as compressed air and electricity. The power plants are situated at Ragged Chute and Hound Chute on the Montreal river, and at the foot of Bass lake, near the mouth of the Metabitchewan. At the first named place the Cobalt Hydraulic Power Company has installed an air-compressing plant on a large scale, and pipes the compressed air to Cobalt. The development here is 4,000 or 5,000 horse power. At Hound Chute the Cobalt Power Company has an electrical equipment capable of delivering about 3,000 horse power. The British Canadian Power Company, formerly Mines Power, Limited, has the plant at Bass lake, its capacity being about 8,000 horse power. This is transmitted to Cobalt in the form of electricity, part of it being then utilized in the compression of air for the operation of drills, etc., in the mines.[2]

The advent of hydraulic power has been a decided advantage to the camp, inasmuch as the power is delivered at a cost of little more than one-third of that produced by the consumption of coal, but it has not been without its drawbacks. Interruptions were not unknown at first, but these were quickly eliminated by greater attention to the equipment. There was also some objection to the use of the compressed air from Ragged Chute by reason of its deficiency in oxygen and consequent inability to support the burning of candles, thus alarming the miners, who suspected bad air. Acetylene lights, however, got rid of this difficulty, and no ill effects were produced upon the

[2] For a description of these power installations, see 19th Report, B. of M., Part I., pp. 133-140.

workmen by the smaller percentage of oxygen. The chief trouble is more fundamental. The cold northern winters, with their infrequent thaws, have the effect of rendering the general drainage system very torpid, and the run-off of water is reduced to a minimum in the months of January, February and March. If the proverbial "January thaw" comes to the relief, the situation is mitigated, but if this fails to arrive or is inadequate to replenish the reservoirs, the water runs through the turbines much faster than it is replaced, and a scarcity of water and reduction in power necessarily follow. The winter of 1910-11 was unusually steady, and in February it began to be apparent that the water-powers on the Montreal and Metabitchewan were likely to be seriously affected. March saw no improvement, and as the return of spring, which the previous year was unusually early, was in 1911 unusually late, the shortage of water and power continued well into April. Such of the mines as had retained their steam plants were obliged to put them again into commission, but in a number of cases steam power was unavailable, and the general effect upon the camp was to cause a decided drop in production. It is possible that the output of silver for 1911 will reflect this partial stoppage of the mines. The remedy is to more nearly equalize the flow of these rivers, which can only be done by a system of dams at the outlets of the lakes and river expansions, thus permitting storage of the freshet waters for use in the low-water periods of summer and winter.

Cobalt

The situation with regard to the cobalt contents of the ores from the mines of Cobalt remains practically as was described in last year's Report.[3] Cobalt oxide as such and in admixture with nickel oxide, is now being produced by the refineries at Deloro and Thorold. Exports, chiefly of the mixed oxides, are made to the European market, but there are shipments of the finished article as well. Attempts are being made to prevent a further fall in the price of cobalt oxide, which is now in the neighbourhood of 75 cents per pound, but the enforced production of the ore, and the practically enforced production of the oxide itself, will almost inevitably lead to a still further lowering of the market value.

Mr. Elwood Haynes, president of the Haynes Automobile Company, Kokomo Indiana, has conducted an interesting series of experiments with cobalt and chromium, by which he has succeeded in obtaining a number of alloys of these metals, some of which give promise of commercial usefulness. Speaking of one of these alloys, containing 75 per cent. cobalt and 25 per cent. chromium, Mr. Haynes says[4]:—

A pocket-knife blade and several table-knife blades were made from this material and were found to be satisfactory in every respect. One of these table-knife blades has now been in use for more than two years in the kitchen, where it was used for all sorts of purposes, such as cutting bread, turning griddle cakes, peeling and paring vegetables, and for various other purposes, such as are known only to the culinary art. After all this use and abuse, the knife shows not the slightest trace of tarnish, and has held its lustre so well that when exposed to the sun it shows a reflection which dazzles the eyes. . . . An alloy of 75 per cent. cobalt and 25 per cent. chromium, to which small quantities of other metals are added, is not only sufficiently hard for good edge tools, but is quite tough and can be bent much beyond its elastic limit without cracking; resembling in this respect the alloy steels, but, generally speaking, it is much harder. A bar of the alloy, ¼-inch square, can be bent cold at right angles without showing any signs of cracking. . . . The colour of the alloy lies between that of steel and silver, and is specially pleasing in bright light. The alloy is also readily polished, but requires special treatment in order to develop its highest lustre.

The most remarkable property of this combination, however, is its resistance to corrosion. It is equalled in this respect only by gold and the metals of the platinum group. It is attacked slowly by dilute hydrochloric acid, and somewhat vigorously by the strong acid, especially when heated. Momentary exposure, however, to either

[3] See Bur. Min., Vol. XIX. (1910), Part I., p. 24.

[4] "The Production of Alloys of Nickel and Cobalt with Chromium," in *The Iron Trade Review*, August 4, 1910, pp. 221-223.

dilute or strong hydrochloric acid has practically no effect upon the metal. Both strong and weak sulphuric acid attack it very slowly when cold, and not very rapidly even when heated. Nitric acid is totally without action upon it, and a polished piece of the alloy may be boiled in it for hours without affecting the lustre of the metal in the slightest degree. Solutions of the caustic alkalies are also totally without action upon it even when boiled for hours. The alloy is likewise proof against all atmospheric influences, whether the air be moist or dry, and retains its brilliant lustre for months or even years, under severest conditions. Even sulphuretted hydrogen, when present in the atmosphere in large quantity, is totally without influence upon it.

Mr. Haynes regards this substance, to which the name "stellite" has been given, as particularly suitable for the manufacture of small cutting instruments, since it takes an edge comparable to that of tempered steel. He states:

It is especially adapted to the manufacture of pocket knives, on account of the beauty of its colour and the brilliancy of its lustre, both of which remain permanent under all circumstances, thus giving the blades a particularly attractive appearance. Knives of this description may be used for cutting fruit without danger of marring their lustre in the slightest degree. Alloys in certain proportions will also doubtless find a wide use for surgical instruments, since they resist perfectly all sterilizing solutions. The alloy is perhaps better adapted for table cutlery than anything that has ever yet been produced. We all know too well that a silver-plated knife, for example, is ill adapted for any service requiring a sharp edge, and it cannot be sharpened without destroying the plating. Steel knives, on the other hand, while they cut well, require endless labour to keep them in presentable condition, and at best, they are unsightly in appearance.

The alloy is also of considerable interest to the chemist and physicist. It is admirably adapted for the manufacture of fine weights for balances, scrapers, spatulas and other laboratory appliances. To the physicist it furnishes a material at once hard, lustrous and untarnishable, and hence well adapted for the manufacture of fine weights, measuring instruments and various small tools.

The alloy is also particularly well adapted for the manufacture of standard weights and measures, such as the gram, kilogram, meter, etc., and it is difficult to see in what respect it is inferior for this purpose to the expensive platinum-iridium alloys now in use.

The alloy could readily be made into laboratory vessels, cooking utensils, spoons, forks, etc., and is limited in this respect only by its cost.

Regarding the cost of stellite, no definite statement can at present be made. It is probable that for the better kinds of cutlery the selling price would not be materially greater than that of the steel now employed. It may be that in this or similar directions an outlet will be found for the cobalt which the mines of the district of that name are now forcing upon an unwilling market.

Bounty on Cobalt Oxide

The bounty on cobalt oxide provided by the Metal Refining Bounty Act (7 Edward VII., chap. 14) was first called for last year, both the Deloro Mining and Reduction Company and the Coniagas Reduction Company having made shipments of the oxide. The bounty is at the rate of six cents per pound of metallic cobalt contents. The theoretical composition of cobalt oxide is 78.66 per cent. cobalt and 21.34 per cent. oxygen, but in actual practice the commercial article contains impurities which reduce the cobalt to 69 or 70 per cent., without, however, interfering with its color-producing properties. The great use of cobalt oxide continues to be for imparting the beautiful and characteristic cobalt blue to the fine chinaware made in France, England and Germany. The reason for exporting the mixed oxides of cobalt and nickel is found in the fact that the cobalt manufacturers of Europe prefer to make the separation themselves, thus enabling them to market the product under their own established brands. The quantity of oxide consumed annually is believed not to exceed 300 or 350 tons, which is much below the equivalent in ore produced every year by the silver mines of Cobalt. Previous to the opening of these mines a small quantity of cobalt was recovered from the nickel-copper mattes of the Sudbury district, but this source of the material is no longer utilized. Indeed, it had fallen into disuse some time previous to the discovery of Cobalt, when the product of the Bessemer converter took the place

of the old low-grade matte in the treatment of the nickel-copper ores. The blowing process to which the molten matte was subjected while in the converter was credited with expelling the cobalt contents.[5]

The total quantity of metallic cobalt contained in the ores raised from the mines of Cobalt last year is estimated at 1,098 tons. Out of this production, the mining companies were paid for 379 tons only, for which they received $54,699, or at the rate of 7.2 cents per pound.

Nickel

There were raised from the nickel-copper mines of Sudbury last year 652,392 tons of ore, of which 628,947 tons were smelted in the blast furnaces and put through the converters. The product was 35,033 tons of Bessemerized matte, 23.6 tons of ore being thus required on an average for one ton of matte. In this quantity of matte there were contained 18,636 tons of nickel, last year's output, 13,141 tons, being exceeded by 5,495 tons, or over 41 per cent. The production of 1910 was much the largest since the nickel mines of Sudbury were opened, a quarter of a century ago, and stamps this field as being the most important source of nickel in the world. The value of the nickel contents of the matte, on the basis of what it is worth—or estimated by the producers to be worth—at the point of production is $4,005,961.

To the output of the Sudbury mines must be added, for the sake of completeness, the nickel contents of the silver ores raised at Cobalt, estimated to amount to 504 tons, bringing the total yield of nickel in 1910 up to 19,140 tons. Nothing is added to the value of the production by the nickel from Cobalt, since the mining companies are paid nothing for it. It cannot be doubted, however, that at least a portion of this nickel yield finds its way into use in the arts, since it must be separated from the cobalt, in order to obtain the latter.

The Sudbury mines are operated by two companies—The Canadian Copper Company, and the Mond Nickel Company.

The former's smelting works are at Copper Cliff, where during the last few years there has been established one of the largest and best-equipped plants of the kind to be found anywhere, costing in the neighbourhood of $4,000,000. Power for operating the mines and works is developed at High Falls on the Spanish river, about 28 miles from Copper Cliff, where there is a natural drop of about 65 feet, increased by damming to 85 feet. About 12,000 horse power can be obtained here, and costs delivered at Copper Cliff about $15 per horsepower-year. Exclusive of capital charges the cost is about $6. The cost of the water power development was about $750,000. Ore is taken for the most part from the Creighton mine, which furnished 391,575 tons out of the 508,404 tons raised by the company in 1910. Of the remainder, 89,219 tons came from Crean Hill, 26,381 tons from No. 2, and 1,229 tons from the Vermilion. Creighton ore contains about 1.5 per cent. copper, and 4.5 per cent. nickel. The workings began as open-cast, the ore coming right to the surface, where the lens was about 400 feet wide. After an opening had been made the full width of the ore and about 700 feet long, to a depth of 190 feet, it was found advisable to resort to the usual method of working by shafts and levels. At the fourth level the ore body has a width of about 250 feet, and ore has been proven for 1,500 feet on the strike of the deposit. The mine is estimated to show 5,000,000 tons of ore without including certain extensions, or about 13 years' supply at the present rate of extraction. The Canadian Copper Company estimates that it has "proved supplies of ore" in its nickel-bearing lands amounting to at least 30,000,000 tons.[6] Crean Hill admirably supplements Creighton for smelting

[5] A recent issue of *La Nature* states that the whole of the cobalt now used in the world comes from the Cobalt mines. The deposits in New Caledonia, which once enjoyed a monopoly, have ceased production, being unable to compete with those of Ontario at the low price to which cobalt oxide has fallen.

[6] *See* "Organization and Equipment of The Canadian Copper Co.," by Alexander Gray, p. 20.

purposes, the silicious character of the ore correcting the more basic nature of the material from Creighton. Since the beginning the ore of the Crean Hill is said to have averaged 6.35 per cent. of the combined metals, the copper being in excess.

The Mond Nickel Company's smelting plant is at Victoria Mines in the township of Denison, and on the Sault branch of the Canadian Pacific railway. This situation is convenient to the Victoria mine, from which until lately the company has drawn the bulk of its ore supply. In view of the fact that most of its ore now comes from the Garson mine, some distance to the northeast of Sudbury, the company is contemplating the removal of its works to a point near Rumford on the main line of the C. P. R., where the distance for ore haulage will not be so great. Last year, out of a total of 143,988 tons of ore raised, 93,542 tons were extracted from the Garson mine, 42,488 tons from Victoria No. 1, and 7,958 tons from Victoria No. 4. At Wabageshik falls on the Vermilion river, the Mond Company have for some years been generating water power for use at Victoria Mines plant and mines, and to serve a like purpose at their new location they have obtained from the government the lease of a power on the Wahnapitae river not far from its mouth.

Monel Metal

Reference has been made in several of the Bureau's Reports to "Monel metal," an alloy of nickel and copper which has been placed on the market by the Canadian Copper Company, and which is produced by that company without separating the metals or either of them from the matte. In fact, it is asserted that the proportions in which the nickel and copper occur in the Canadian Copper Company's ores are almost precisely those required for the alloy, which are about 67 per cent. nickel and 27 per cent. copper, and that by careful attention to the furnace charge a Bessemer matte can be produced within one per cent. of that required in making Monel metal. Considerable quantities of this alloy are now coming into use. It is claimed to possess great strength and to be practically non-corrodible. It has been employed as castings in the manufacture of propellers for vessels of the United States navy and private yachts, in pump linings, steam turbine nozzles and valve fittings for superheated steam, in dairy machinery, refrigerating plants, and pickling apparatus in steel mills; in rod form, for pump rods, bolt and nut stock, steam turbine parts, stock for drop forgings, electrical apparatus, motor boat shafting, pickle pins and valve stems; as sheets, for roofing railway terminals and other large buildings, for mine screens and chutes, smelter roofs, skylights and window frames, boat sheathing, cooking utensils and chemical apparatus, also for steam turbine blades; in the form of wire for wire cloth, motor cycle spokes, rope for mine hoists and cableways, nails, screws, rivets, etc.; and many other applications where high tensile strength, combined with non-corrosive features are essential.

The use of nickel for coinage purposes is spreading. In 1909 the Government of Turkey was authorized to put out an issue of coins made of nickel or aluminium. The latter metal, upon being tested, not having given satisfactory results, nickel was decided upon, and it has been resolved to issue 120 millions of 5-para pieces, 120 millions of 10-paras, 70 millions of 20-paras, and 20 millions of 40-paras, in all 330 million pieces. The money is all to be coined in four years and issued in twenty.

The development of nickel-copper mining and smelting during the last five years is shown by the figures contained in the following table:—

Table IX.—Nickel-Copper Mining, 1906 to 1910

Schedule.		1906.	1907.	1908.	1909.	1910.
Ore raised	tons	343,814	351,916	409,551	451,892	652,392
Ore smelted	"	340,059	359,076	360,180	462,336	628,947
Bessemer matte produced	"	20,364	22,041	21,197	25,845	35,033
Nickel contents	"	10,776	10,602	9,563	13,141	18,636
Copper contents	"	5,260	7,003	7,501	7,873	9,630
Value of Nickel	$	3,839,419	2,270,442	1,866,059	2,790,798	4,005,961
Value of Copper	"	806,413	1,020,913	1,062,680	1,122,219	1,374,103
Wages paid	"	1,117,420	1,278,694	1,286,265	1,234,904	1,698,184
Men employed	No.	1,117	1,660	1,680	1,796	2,156

The valuation of the nickel and copper contents of the mattes in the above table is that placed upon them by the producers themselves.

In last year's Report[7] the remark was made that the Mond Nickel Company has had a successful career, the proof being supplied by statistics of this company's earnings and dividends paid, quoted from the London *Statist* of July 2, 1910. The remark may here be repeated as applied to the Canadian Copper Company. In the pamphlet by Mr. Alexander Gray, already cited, which was issued and circulated by the company itself, it is stated[8] that "a horizontal valuation of $5 to $6 per ton (of ore) mined, as a com- "promise, might not be so wide of the mark. A net profit of $1.50 to $2.00 per ton mined "would then be a conservative, if unauthorized, estimate. That would mean a yearly "profit of $522,900, or $697,200 as applied to 1909 mining operations. The 13,000,000 "lbs. of the nickel disposed of in 1909, it is claimed, brought a profit of 7½ cents per "pound spread over mining, smelting and refining charges." At this rate, the profit on the ore smelted in 1910 would be from $726,253 to $968,338, and on the ultimate product, or nickel marketed, of $2,377,200. This is not a bad showing for a Canadian mining company, even if it covers also the operations of a refining works in the United States. Yet no one will grudge the substantial reward which is now being and has for a number of years been reaped by the pioneer company of the Ontario nickel mining industry, whose career has been marked by self-reliance, courage and persistency, and whose business record in Northern Ontario stands second to none.

The only other important source of nickel is the island of New Caledonia, whose output, however, in proportion to the whole, is now much less than that of Sudbury. *Société le Nickel*, whose production is of New Caledonian ores, operates refineries in France, England and Germany. From 1900 to 1909 the French production fell from 1,700 to 1,200 tons, while that in England rose from 1,500 to 2,800 tons, and in Germany from 1,400 to 3,100 tons. Thus in 1909 the total output of nickel from New Caledonia was 7,100 tons. In the same year the yield from the Sudbury mines was 13,141 tons. *Le Nickel* proposes to erect a refinery in New Caledonia to treat the ore on the spot. (See Le Bulletin du Commerce, Noumea, New Caledonia, 1 April, 1911.)

Other statistics of the nickel-copper industry for the past year show that 24,651 cords of wood valued at $76,705 or $3.11 per cord were used, mostly in "heap-roasting" the ore, and 95,172 tons of coke costing $696,851 or $7.32 per ton, were consumed in reducing the ore to matte.

Copper

The copper product of Ontario in 1910 amounted to 9,630 tons, valued at $1,374,103, being an increase over the output of 1909 of 1,697 tons in weight and $247,088 in value. It was all contained in the nickel-copper mattes produced by the Sudbury smelters. The only non-nickeliferous mine which contributed to the total was Bruce Mines, a quantity of ore from which was shipped to Victoria Mines and used by the Mond Nickel Company for lining the Bessemer converters which produced the matte.

Small quantities of copper ore were raised by the Hermina Mining Company, the Parry Sound Copper Company and the Meridian Bay Mining Company, but none was shipped by any of these companies.

Iron Ore

The shipping iron mines last year were the Helen, Moose Mountain, Atikokan and Mineral Range. Their combined output was 230,656 tons valued at $513,721, a shortage as compared with 1909 of 33,121 tons of ore and $131,901 in value. Of the output 112,246 tons were hematite, and 118,410 tons magnetite.

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[7] Page 20. [8] Page 21.

A large deposit of magnetic ore has been under development by the Lake Superior Corporation at Magpie, in the Michipicoten district, 15 miles northeast of the Helen mine. Some seventeen drill holes have been put down, to an aggregate depth of several thousand feet, and Mr. R. W. Seelye, manager of the company's mines department, computes that between 15 and 20 million tons of ore have been shown up. The ore is metamorphic after siderite, the sulphur contents and carbon dioxide being, of course, objectionable for furnace practice. A series of experiments was undertaken by the company with the view of determining the best method of eleminating these undesirable elements. The results, Mr. Seelye states, are such as to leave no doubt that the ore can be successfully treated and the deposit utilized.

Search for bodies of workable ore goes on unremittingly, not only in northern, but also in eastern Ontario. Special interest has been aroused by the endeavour to determine the extent and value of the large iron carbonate outcrops on the Mattagami river, and the report of Mr. M. B. Baker who visited the region for the Bureau last year presents the data available at present on this point. Reports of large surface showings of iron ore are brought from the neighbourhood of Bending and Stony lakes, west of the main line of the Canadian Pacific railway at Ignace station. In the eastern part of the Province a considerable body of magnetite is said to have been discovered along the line of the Kingston and Pembroke railway not far from the Wilbur mine. Preparations are also being made for the erection of magnetic concentration plants at Collins Bay, near Kingston, and at Trenton.

Pig Iron and Steel

There are now eight blast furnaces producing pig iron in Ontario, distributed as follows: Algoma Steel Company, Sault Ste. Marie, two; Hamilton Steel and Iron Company, Hamilton, two; Atikokan Iron Company, Port Arthur, one; Canada Iron Corporation, Midland, two; Standard Chemical Company, Deseronto, one. The combined product in 1910 was 447,351 tons of pig iron, valued at $6,975,418, or an average of $15.59 per ton. In 1909 the furnaces were seven in number, and the production was 407,013 tons worth $6,301,528. The additional furnace blown in last year was at the works of the Canada Iron Corporation, Midland. There were made at Sault Ste. Marie and Hamilton 331,321 tons of steel, 233,621 tons of the pig product at the two places being used in the manufacture. The plant at Sault Ste. Marie makes steel rails exclusively, while at Hamilton, basic open hearth ingots are produced, a large tonnage of which is further developed into billets, forgings, spikes and bar iron and steel.

The blast furnace operations for the past year are shown in the following statistics:

Ontario ore smelted	tons 143,284
Foreign " "	" 678,890
Scale and mill cinder smelted	" 15,584
Limestone for flux	" 248,750
Coke for fuel	" 471,493
Value of do	$2,237,039
Charcoal for fuel	bush. 1,133,419
Value of do	$107,675
Pig iron product	tons 447,351
Value of do	$6,975,418
Steel product	tons 331,321
Value of do	$7,855,407
Workmen employed	No. 2,120
Wages paid	$1,443,904

At Welland, where cheap electric power is available, a considerable industrial development is going on. Among the plants established there is that of the Electro-Metals, Limited, where ferro-silicon is made from iron ore and silica (flint, sandstone

and sand). The product contains about 50 per cent. silica. Some 4,343 tons of iron ore were used last year. Seven electric furnaces are operated and about 115 workmen employed.

In the table which follows are set forth details of the iron and steelmaking industry of the Province during the last five years:

Table X.—Production Iron and Steel, 1906 to 1910

Schedule.	1906.	1907.	1908.	1909.	1910.
Ontario ore smelted.....tons	101,569	120,156	170,215	220,307	143,284
Foreign ore smelted ... . "	396,463	388,727	342,747	543,544	678,890
Limestone for flux..... "	153,702	171,037	179,741	226,991	248,750
Coke ..... "	304,676	326,937	322,817	436,707	471,493
Charcoal.....bush.	811,926	1,849	.....	973,413	1,133,419
Pig iron.....tons	275,558	286,216	271,656	407,013	447,351
Value of pig iron ..... $	4,554,247	4,716,857	4,390,839	6,301,528	6,975,418
Steel ....tons	167,026	237,855	172,108	296,031	331,311
Value of steel .... $	4,202,278	4,168,127	4,397,082	6,759,960	7,855,407

Zinc Ore

The quantity of zinc ore raised and shipped last year was 576 tons, valued at $5,760 or $10 per ton.

Materials of Construction

Materials of construction include building brick, lime, stone and cement. In presenting statistics regarding the first three of these articles it is difficult to entirely separate the data pertaining solely to them, so far as labour and wages are concerned, for the reason that in many cases other branches of manufacture are carried on, and other articles produced, from the same raw material and with the same workmen. For instance, drain tile is quite commonly made in brickyards, comparatively few tileyards being carried on as distinct from yards in which brick is made. The burning of lime is usually a separate industry, but is sometimes associated with the quarrying of limestone for construction or other purposes. Again, the small limekiln operated by a farmer or his sons on his own land still survives in some localities, and in such cases it is generally impracticable to assign any definite number of days as having been spent at the limekiln, or any definite sum paid out or earned for labour. This occasionally happens with brick as well. The evolution of the brick-making, lime-burning and quarrying industries, however, is proceeding on the same lines as that of practically all other industries; small producers are disappearing through the pressure of competition, or by the familiar process of "merging" or "consolidation," which relieves the market of too many rivals for business. The larger concerns, however, have advantages from a statistical point of view; more accurate records are kept, and business details, are as a rule, well looked after. The manufacture of cement is almost wholly a distinct industry, and is not subject to the difficulties mentioned.

Brick

The number of common building brick made in 1910 was 304,988 thousand, worth $2,374,287, as compared with 246,308 thousand, worth $1,916,147 in 1909—an increase in both number and value of over 23 per cent. The average value placed upon the output in 1910 was exactly the same as in 1909—$7.78 per thousand. There was a very active demand for brick throughout the year, the city yards in particular being barely able to supply the requirements of the building trade, and this condition of affairs is likely to extend into 1911. For the most part, the cities and towns of Ontario are made of brick, the manufacture of which has been much improved of late years, and which lends itself to variety and novelty in building effects more readily than stone, while being less subject to fire than wood.

Pressed brick, averaging in cost $10.37 per thousand, were made to the number of 44,204,295, the value being $458,596. For the moment, popular taste seems to have veered from the smooth, almost polished surface of the first-class pressed brick with its uniformity of coloring, which sprang into demand a number of years ago, to the rougher, less regularly formed hard-burned brick now in favour, in which all shades of colour are not only permissible, but desired. In 1909, 53,166,941 pressed brick were turned out, valued at $490,571.

The use of paving brick has not become so general as at one time appeared probable. A good vitrified brick makes a durable, easily repaired roadway, but it is undeniably noisy, and to this disadvantage, more than to any other feature, appears to be due the slow progress paving brick has made towards popularity. In 1909, 4,607,620 were produced in Ontario, valued at $73,700, while last year, the output fell to 3,799,025, worth $70,648.

The total value of all kinds of brick made in 1910 was $2,903,531, in the manufacture of which, including tile, 3,559 men were employed, receiving as wages $1,423,751. The average yearly wage per man was therefore $400. In 1909 it was only $303, and it is therefore evident that the brickmaking season, which for the most part extends over the months of late spring, summer and early autumn only, was last year stretched out to an unusual length.

Lime and Stone

The limestone formations of older Ontario are widespread; indeed, the soil on which resides much the greater portion of the Province's population is underlaid by limestone, and this fact ensures an ample supply of lime throughout the settled part of Ontario at reasonable cost. The newer districts which have so far been opened up for settlement are not on the whole so well provided for in these respects, especially those regions where the pre-Cambrian rocks are hidden, in some places scantily enough, by the sandy and gravelly deposits of glacial origin. In the so-called clay belt, however, the southern extension of which is traversed by the Temiskaming and Northern Ontario railway, and the main body by the Transcontinental line, the geological and soil conditions of older Ontario are more nearly repeated, and settlers in these regions need fear scarcity neither of lime nor brick.

In 1910 the lime-kilns of Ontario produced 2,889,235 bushels of lime, valued at $474,531, a somewhat larger output than in 1909, when the figures were given us 2,633,500 bushels, valued at $470,858.

Of building and crushed stone the production last year had a value of $761,126, as compared with $660,000 in 1909. Much of the stone is used in the construction of buildings, the better qualities in the superstructures and the rougher or less valuable sorts in the foundations, and the broken or crushed material is utilized for pavement foundations, macadamized roads, and when of limestone, for flux in blast furnaces. High-grade carbonates of lime are used also for certain chemical purposes, among others, the manufacture of lime-sulphur solutions for the spraying of fruit trees, etc. Dolomite carrying a high percentage of magnesia is also used in making Epsom salts.

Some large slabs of fine marble taken from quarries at Bancroft and shown in the mineral display made by the Bureau of Mines at the Toronto Exhibition in 1909 and 1910, drew attention to these deposits, and the material has been used for dados and halls, etc., in some public buildings recently erected in Toronto. A variety of colorings is obtained, one being a blending of mauve and gray in which the shades harmonize beautifully, and another a striking mixture of red and black. The stone itself is a species of dolomite. From Marble Bluff, in the County of Lanark, are obtained handsome serpentines of various shades of green, which bid fair to come into demand. The companies interested are The Ontario Marble Quarries, Limited, Bancroft, and the Central Ontario Granite and Marble Company, Limited, Trenton, for the beds in Bancroft, and the North Lanark Marble and Granite Quarries, Limited, St. Catharines, in those of Lanark county. The

marble deposits of Ontario, as yet largely undeveloped, will undoubtedly in the future largely replace the quarries of Italy and Tennessee as a source of this decorative material, since it is apparent that in beauty and variety of markings, as well as in size of blocks, they can easily meet foreign competition. Specimens showing a wide range of shades have also been brought from the unsurveyed territory near lake Nipigon, which when polished are very pleasing to the eye.

Considerable granite was taken out last year by Messrs. David J. Gordon and Son from their quarries near Gananoque.

Portland Cement

The manufacture of Portland cement in Ontario began in 1891, and each successive year has seen a larger production than the one before. In 1910, 2,471,837 barrels were made, having a value of $3,144,343, the average price per barrel at the works being $1.273, a slight increase over that of 1909, when it was $1.257. In the latter year the production amounted to 2,303,263 barrels, worth $2,897,348.

The Canada Cement Company, by which title the "merger" is known which in 1909 united under one management the largest producers in Ontario as well as several in other parts of Canada, produced much the larger share of the cement made in 1910. This company operated plants at the following places: Port Colborne, Marlbank, Belleville (Lehigh), Owen Sound and Lakefield, the last-named to a small extent only. Outside of the "merger," the National Cement Company of Durham was the largest producer; others were Kirkfield Portland Cement Company, Kirkfield; Imperial Cement Company, Owen Sound; Ontario Portland Cement Company, Blue Lake; Hanover Portland Cement Company, Hanover; Superior Portland Cement Company, Orangeville; Maple Leaf Portland Cement Company, Atwood; and Sun Portland Cement Company, Owen Sound. The Ben Allen Portland Cement Company was idle and the Crown Portland Cement Company made no return. In the various factories 1,233 men were employed who received in wages $713,550.

The tendency in the manufacture of Portland cement is strongly towards the use of solid rock for supplying the carbonate of lime, rather than shell marl. At the outset of the industry, the latter was exclusively employed, but it was found more economical to raise and grind the rock than to dredge the marl and handle the large proportion of water accompanying it. The rock has the additional advantage of occurring in almost inexhaustible supply, as contrasted with the limited deposits of marl. It does not appear that there is any marked difference in the quality of the resulting cement.

The uses to which Portland cement is being put, are almost endless. It is taking the place for certain purposes, not only of brick and stone, but of iron and wood. One of the latest employments of this article, for which it answers admirably, is in making the electric light poles with which the hydro-electric commission is studding the streets of Toronto.

Other Clay Products

Of drain tile the quantity returned as having been made in 1910 was 21,028,000, valued at $318,456, a considerable reduction from the output of 1909, which was 27,418,000, worth $363,550.

Sewer pipe to the value of $357,087 was made last year, an increase of $45,257, as compared with 1909. Three factories were in operation, namely, Dominion Sewer Pipe Company, Swansea, Ontario Sewer Pipe Company, Mimico, and Hamilton and Toronto Sewer Pipe Company, Hamilton.

From the potteries of the Province, goods valued at $51,489 were turned out in 1910. This compares with $43,214 worth made in 1909. The growth of the pottery industry in Ontario is slow. In 1891, the first year of the Bureau's existence,

the production amounted to $45,000. Doubtless the explanation is to be found in the scarcity or absence of clay suitable for the finer kinds of ware, the articles now made being for the most part coarse goods such as flower pots, jardinieres, etc. Two or three establishments manufacture higher grade goods, such as the so-called "stoneware," also majolica ware, but the clay for these is imported. Perhaps when population flows over the height of land the kaolinic clays found in the valleys of some of the north-flowing streams may be put in requisition to supply the wants of the inhabitants of newer Ontario.

Arsenic

From the silver-cobalt ores of the Cobalt mines treated in their plants, the Copper Cliff, Deloro and Coniagas refining companies recovered and marketed 1,524 tons of arsenic in the form of refined arsenious acid or white arsenic. According to the estimate made on a previous page, the total quantity of arsenic in the Cobalt ores raised during the year was 4,897 tons, so that 3,373 tons are to be accounted for as contained in the ores and concentrates exported and treated elsewhere. Beyond doubt a considerable proportion of this arsenic is lost, and the full arsenical contents of the ores raised at Cobalt consequently fail of utilization.

The value placed by the smelting companies in their returns to the Bureau upon the 1,524 tons of white arsenic was $70,709, an average of 2.31 cents per pound. The consumption of arsenic has not kept pace with the increase in supply, and since the opening of the Cobalt mines the price has fallen from six or even seven cents per pound to less than three. Under these conditions, there is no incentive for the opening up of new sources of this article. There are many deposits of mispickel, some of them auriferous, in Ontario, but unless the gold contents can be extracted at a profit without reference to the arsenic, there is little likelihood of their being developed while present conditions prevail.

The uses of arsenic are many—in medicine, as an insecticide, in the manufacture of pigments, and also in importing a peculiar brilliancy to plate and other glass.

Iron Pyrites

The pyrite deposits of Ontario yielded in 1910 33,812 tons of ore, worth at the mines $98,353, an average of $2.90 per ton. The output in 1909 was 28,946 tons valued at $78,170. The largest producer was the Helen iron mine, where the pyrite occurs under unusual conditions. Bodies of finely granular ore are met with enclosed in iron ore, and much care is required in handling them, since when cut into the pyritic sand runs out almost as freely as water. The Nicholls Chemical Company, whose mines and acid works are at Sulphide, Hastings county, raised a good deal of ore, and has recently much enlarged its acid-making plant. The Northland mine at Rib lake, Temagami Forest Reserve, was leased by Mr. C. B. Stranahan and worked by him from 23rd May to 1st September, 1910, during which time considerable ore was raised and shipped. The Canadian Sulphur Ore Company at Queensboro, and the Ontario Sulphur Mines, Limited, at Tweed, were both engaged in opening up deposits of pyrite and made shipments of ore. The large bodies of pyrite at lake Minnetakie, near Superior Junction, which have been under development for several years by the Northern Pyrites Company, sent away none of their output last year, but will probably enter the market on a considerable scale in 1911. The geology of the neighborhood has been worked out by Dr. E. S. Moore.

The following table shows in brief form the development of iron pyrites mining in Ontario from 1906 to 1910:—

Table XI.—Production of Iron Pyrites, 1906 to 1910

Schedule.	1906.	1907.	1908.	1909.	1910.
Pyrites shipped ..... tons	11,090	15,755	20,970	28,946	33,812
Value of do ..... $	40,583	51,842	69,980	78,170	98,353
Workmen employed ..... No.	128	137	132	132	227
Wages paid ..... $	57,580	75,365	95,740	104,687	117,191

So far, it will be observed, the yearly wage-bill has exceeded the value of the output. This condition is due to the fact that some of the deposits, including the largest, have been continuously under development, and have not yet begun to ship in quantity. There are numerous bodies of pyrite in the Province, some of them extensive, upon which no mining has been done.[9] Want of railway communication is, doubtless, in part at least, the cause. The chief use of iron pyrites is, of course, in the production of sulphuric, nitric and "mixed" acids, for which purpose it has of late years replaced native sulphur where transportation charges gave it an advantage in the market. By "dead-roasting" the pyrite the cinder remaining after the sulphur is expelled can be used as iron ore.

Mica

The output of the amber mica mines of Ontario in 1910 was somewhat greater than in the previous year, being 513 tons of cobbed material, worth $85,294, as against 350 tons, worth $73,124 in 1909. Producers were Loughboro Mining Company, Sydenham; Kent Bros. and J. M. Stoness, Kingston; Scriven and Whyte, Sydenham; Kingston Feldspar and Mining Company, Kingston; Dominion Improvement and Development Company, Perth; J. W. Trousdale, Sydenham; W. L. McLaren, Perth; Rinaldo McConnell, Ottawa. The mica came wholly from the deposits of Lanark and Frontenac counties, which furnish a standard article and have been operated for many years. There is mica in other parts of the Province, notably the districts of Muskoka, Parry Sound and Nipissing, but little has yet been produced in a commercial way. The demand and consequently the prices for mica were better in 1910 than in the previous year.

Salt

The salt production of Ontario varies comparatively little from year to year. In 1910 the output was 84,071 tons, valued at $414,978, while in 1909 it was 77,490 tons, worth $389,573. The number of men employed in the industry was 202, and the amount paid as wages, $114,056.

The Canadian Salt Company, Limited, whose plants are at Windsor and Sandwich, is the chief producer of salt; others are Western Canada Flour Mills Company, Limited, Goderich; Dominion Salt Company, Limited, Sarnia, (this company took over the works of the Empire Salt Company and the Cleveland-Sarnia Saw Mills Company during the year); The Elarton Salt Works Company, Elarton; The Gray, Young and Sparling Company of Ontario, Limited, Wingham; The Western Salt Company, Limited, Mooretown; Ontario People's Salt and Soda Company, Limited, Kincardine; Parkhill Salt Company, Parkhill; Exeter Salt Works Company, Limited, Exeter; John Ransford, Stapleton.

The Pursuit of Potash

Many inquiries have been received at the Bureau of Mines regarding deposits of potash supposed to have been found in connection with salt wells at or near Goderich. These inquiries were prompted by a despatch which received wide publicity in the press, purporting to come from Berlin, Germany, and asserting that such deposits

[9] See, for instance, Bur. Min., Vol. XV. (1906), pp. 183-187, for description of deposits at Goudreau lake, Michipicoten district, "probably the largest known deposits of Ontario," by Dr. A. P. Coleman. Also "Iron Pyrites in Ontario," by E. L. Fraleck, Bur. Min., Ont., Vol. XVI., (1907), pp. 149-201.

had been located and a company formed to work them. Inquiry was made on the spot by Mr. C. W. Knight, Assistant Provincial Geologist, but it could not be found that there was any foundation whatever for the report, which may possibly have had its origin in the controversy that has for some time been on foot regarding the supply of potash from the German deposits to consumers in the United States.

There is no doubt that the discovery of potash salts in quantity would be a boon to the agricultural interests of Ontario, and indeed of the Dominion at large. Wood ashes, which in the early days of settlement when the forest was being cleared away and burned were plentiful and were largely made use of for the extraction of potash salts, are now no longer to be had in quantity, and our agriculturists are dependent for potash upon foreign sources of supply, which means Germany. There the potash deposits at Stassfurt are found in association with common salt, and no doubt the persons responsible for the report assumed that existence of salt at Goderich was a sufficient basis for diagnosing potash there as well. There is no evidence that such is the case. Indeed, there is evidence to the contrary. That eminent chemist and man of science, the late Dr. T. Sterry Hunt, made an examination of the salt wells at Goderich and especially of the diamond drill cores taken from the deep borings made by Mr. Attrill at that place many years ago. Dr. Hunt's report is published in the Report of the Geological Survey of Canada for 1876-7, and states that the cores were carefully tested for salts of magnesia and potash. In no case were any appreciable quantities found. Samples of salt of the pure white variety and also of the dark-colored, low-grade material, were taken by Mr. Knight and were analyzed by Mr. N. L. Turner, Provincial Assayer, who reported a trace of potash only in each sample. So far the result of inquiries has been negative. In the case of a brine from across the lake in Michigan, four analyses gave fairly concordant results, showing nearly 38 grammes of potassium chloride per litre, while the sodium chloride gave 197 grammes.

The Potash Deposits of Stassfurt

In view of the interest which the supposed potash deposits have created, and the importance of the German resources of this mineral, Mr. Knight has prepared the following brief description of the mines at Stassfurt:—

The potash mines are situated near the Harz mountains. Some are in the province of Hanover, some in Brunswick and some near the Thuringian forest. At first the deposits of rock salt only were utilized, the value of the other potash salts not being known. In 1857 a large bed of rock salt was penetrated at a depth of 1,080 feet, and overlying this bed was a layer of potassium and magnesium compounds. Four years later a process was perfected for extracting potassium chloride.

According to George Ryse (London *Mining Journal*, 19th January, 1907), the lowest stratum consists of the least soluble material, anhydrite ($CaSO_4$). The next above is rock salt interspersed with lamellar deposits of anhydrite which are gradually replaced by polyhalite, or sulphates of lime, potash and magnesia. Above this region, known as the polyhalite region, comes the kieserite region, in which, imbedded between rock salt, occurs kieserite or magnesium sulphate. Above this occurs the carnallite region, consisting of the chlorides of potash and magnesia. This stratum is 50 to 150 feet thick, and yields the most important of the crude potash salts from which is obtained the bulk of the refined product. Finally, strata of impervious salt-clay, anhydrite, and a remarkably pure deposit of rock salt are found, in the order named, and above all there are strata of gypsum, clay, sandstone and limestone which outcrop at the surface.

The deposits cover an area of about 100 square miles and in depth extend to probably 5,000 feet. Circular shafts, 18 to 20 feet in diameter, are sunk to levels 1,200 or 1,500 feet below the surface, and are lined either with concrete or iron tubing. Extreme caution must be exercised to prevent any inflow of water, and it is customary to have a reserve shaft at nearly all the mines. Another danger is from falling roofs, and all worked out portions of the mines are filled with waste and rock salt.

Of the various crude salts mined, by far the most important is carnallite. It occurs clear and transparent, or any shade of yellow, red, gray or black. These colors are due to impurities such as oxide of iron, clay, organic matter, etc. On account of its hygroscopic nature and its small percentage of potash, carnallite is used as a fertilizer only in localities which are not too far from the mines. Next to carnallite in import-

ance is kainite, the sulphates of potassium, magnesium and chloride of magnesium. It is too closely intermixed with rock salt to attempt separation, and consequently it is put on the market containing about 30 to 40 per cent. of rock salt. The last mineral of general importance is sylvite. It contains about 22 to 30 per cent KCl, 50 to 65 per cent. NaCl, and 4 to 12 per cent. K_2SO_4. It is richer in potash than kainite.

The primary material for all manufacturers is carnallite, having an average of 9 per cent. pure potash. The roughly ground carnallite (KCl, $MgCl_2$, 6 H_2O,) comes first into large dissolving vats, wherein it is treated with chloride of magnesia liquor, steam being passed through to aid dissolving. The chloride of potash, which is more soluble than sodium chloride in a saturated solution of magnesium chloride, is dissolved out, and a turbidity results. When the turbidity which is due to NaCl and $MgSO_4$ has settled, the solution is run into large iron crystallizing tanks, and allowed to cool for three or four days. It still contains from 25 to 40 per cent. NaCl. By evaporation and subsequent cooling of the mother liquor an artificial carnallite is obtained, which after being again dissolved in hot water, forms crystals of pure chloride of potash.

The chloride of potash from the crystallizations is ultimately washed with cold water, in order to remove the chloride of sodium and chloride of magnesium. After drying, the final product is a chloride of potash, 70 to 99 per cent. pure, according to the process adopted. The salts are then dried in ordinary furnaces or in calcining furnaces.

From kainite, by a somewhat complicated process, sulphate of potash and magnesia is obtained, in two forms, viz., crystallized with 40 per cent., and calcined with 48 per cent. sulphate of potash. The latter is used for fertilizing: the greater part of the former is utilized for the manufacture of sulphate of potash 90 to 96 per cent. pure. After producing the chloride of potash, there remains a mother liquor, consisting mainly of chloride of magnesium and 2 per cent. of bromine. From this solution the $MgCl_2$ is recovered by simple evaporation, and the bromine either by treatment with chloride or by the electrolytic method. About two-thirds of the total production of the chloride, one-eighth of the sulphate and the whole of the crystallized sulphate of potassium and magnesium are used for the manufacture of the various salts and compounds of potassium.

The salt beds of North Germany belong to the Permian, or on the border of the Diassic and Triassic formation. The beds lie at angles of 0 to 70 degrees at Stassfurt.

The deposition of the salt layers took place by the evaporation of salt water, with desert conditions prevailing. Interbedded with the salt beds are anhydrite, black shale, and bituminous limestone.

The carnallite region is a seam some 25 metres thick, extending over the whole salt deposits, and is the particular layer in which the potash salts are mined. The average composition of the carnallite deposits is 55 per cent. carnallite (KCl, MgCl, 6 H_2O) 26 per cent. rock salt, 17 per cent. kieserite ($MgSo_4$), 2 per cent. of other substances. Carnallite contains 26.7 per cent. KCl (Potassium chloride).

In boring at Unseburg, near Stassfurt, the rock salt underlying the potash-bearing salts was reached at a depth of only 80 metres, the lower layer being reached at 1,250 metres. Under these salt layers, anhydrite, black shale and bituminous limestone were bored through, and again at a depth of 1,280-1,290 metres rock salt was struck; at 1,295 metres boring ceased in gray anhydrite. The immensity of the rock salt deposit here may be realized from the fact that taken perpendicularly the measurement is 900 metres, the beds lying at an angle of 35 to 45 degrees.

A bountiful supply of potash is contained in the feldspar deposits at Verona and elsewhere on the line of the Kingston and Pembroke railway, this material containing as much as 13 or 14 per cent. of potash. The difficulty is that no feasible method has yet been discovered for converting the contained potash into soluble form. It has been stated that finely pulverized feldspar when applied directly to the ground will part with potash, though slowly, and thus act as a fertilizer. With the view of ascertaining the value of ground feldspar, a quantity from the deposits of the Kingston Feldspar and Mining Company has been forwarded to the Ontario Agricultural College at Guelph, where experiments will be conducted by the authorities of that institution.

Petroleum

The yield of petroleum again fell off markedly last year; indeed, the decrease in production which has been going on for a number of years has reduced the annual output to less than one-third that of 20 years ago. From the Department of Trade and Commerce, Ottawa, it is learned that the quantity of crude petroleum produced in

Ontario of which returns were made for purposes of the bounty amounting to 1½ cents per gallon paid by the Dominion Government, was 11,004,357 Imperial gallons. Mr. W. J. Harvey, Supervisor of Crude Petroleum Bounties, Petrolea, kindly furnishes a statement of the output by districts, as follows:—

	Bbls.	Gals.
Lambton	205,456—	1
Tilbury	63,057—	21
Bothwell	36,998—	19
Dutton	7,751—	21
Onondaga (Brant Co.)	1,005—	3
Leamington	141—	12
Total	314,410—	7

The falling-off has not been confined to any one field, but is general, though more noticeable in the newer Tilbury and Leamington districts than in the older Lambton field. The following comparative statement of production by districts shows how the diminution in yield has been going on during the last five years:—

Table XII.—Petroleum Production by Districts, 1906 to 1910

Field.	1906.	1907.	1908.	1909.	1910.
	bbl.	bbl.	bbl.	bbl.	bbl.
Lambton	377,286	304,212	265,368	243,123	205,456
Tilbury and Romney	106,992	411,588	201,283	124,003	63,058
Bothwell	44,827	42,727	39,228	38,092	36,999
Leamington	39,652	6,133	9,334	5,929	141
Dutton	19,376	14,977	13,743	9,513	7,752
Thamesville	175	237	.....	.....	.....
Comber	651	.....	.....	.....	.....
Onondaga (Brant Co.)	.....	.....	.....	.....	1,005
Total	588,962	779,876	528,959	420,660	314,410

It will be seen that in the Lambton field the production fell off between 1906 and 1910 45.5 per cent.; in Tilbury-Romney the decline from the maximum output in 1907 was 84.6 per cent.; in Bothwell the drop from 1906 was 17.7 per cent.; in Leamington production has practically ceased, and in Dutton the decline was at the rate of 60 per cent. The only offset to this rapid decrease, which if continued will bring total exhaustion within sight, is the strike made last year in the township of Onondaga, near Brantford, where oil was found in the white Medina sandstone, the yield from two wells in 1909 being 1,005 barrels. A short description of this new oil field, by Mr. G. R. Mickle, Mine Assessor, is given below. The oil is of a superior quality, and brought a price of $1.29 per barrel at the close of the year. The average price for Petrolea crude during the year was $1.23 per barrel and for Tilbury, $1.06. On this basis, the value of the total crude production was $368,153.

The output of domestic crude being quite inadequate to meet the requirements of refiners, the deficiency is being made up by imports from the oil fields of the United States. The quantity of Canadian crude oil distilled in the refineries of the Province last year was 13,758,170 gallons, and of imported crude 17,227,262 gallons. In the following table are given details of the operations carried on by the oil-refining works, of which there are two, the Imperial Oil Company, Sarnia, and the Canadian Oil Companies, Limited, Petrolea:—

Table XIII.—Petroleum and Petroleum Products, 1906 to 1910

Schedule.		1906.	1907.	1908.	1909.	1910.
Crude produced	Imp. gal.	19,928,322	27,621,851	18,479,547	14,723,105	11,004,357
Crude distilled	"	36,134,349	34,961,706	34,675,120	35,530,918	36,171,032
Value crude produced	$	761,546	1,049,631	703,773	559,478	368,153
Value distilled products	"	2,506,177	2,568,464	2,347,680	2,501,384	2,511,368
Illuminating oil	Imp. gal.	16,125,450	18,319,233	17,604,920	17,902,254	18,983,357
Lubricating oil	"	4,351,818	3,931,767	3,384,940	3,856,778	4,469,038
Benzine and naphtha	"	3,497,954	4,132,239	3,667,997	3,930,691	4,297,615
Gas and fuel oils and tar	"	5,961,834	5,632,608	4,461,186	4,687,588	5,876,498
Paraffin wax and candles	lb.	5,011,467	5,132,394	5,400,003	7,092,278	5,179,391
Workmen employed	No.	496	435	430	436	428
Wages paid	$	308,986	265,316	247,829	261,014	280,485

Mr. John Scott, Inspector of oil and gas wells under 7 Edward VII., chapter 47, reports that during the year 1910 there were abandoned in the Petrolea field 194 oil wells, in the Tilbury field 148, in Raleigh 8, and in Romney 5, a total of 355 wells. In addition to the foregoing there are in the Petrolea district 649 oil wells from which the pumps have been removed (the wells not being abandoned) but which are being baled with fairly good results in many cases. No doubt some of these will be abandoned later. The repairing of defective oil wells and the proper plugging of abandoned ones have much improved the conditions in the fields of Lambton county. Many of the wells that remain are doing better and are more satisfactory in operation. No apparent benefit has been noted to the remaining wells in the Tilbury fields. There have been no important extensions to any of the various oil fields. The total production of crude oil has decreased, chiefly owing to the failure of the new fields at Tilbury and Romney, which appear to be about pumped out, and have to date proved very disappointing.

Mr. Scott's experience leads him to the conclusion that by taking good care of the wells, and regularly adding a few new ones, the production in the older fields may be maintained.

New Oil Field in Onondaga Township

Mr. Mickle's account of the Onondaga field is as follows:

This new oil territory, shown on the accompanying plan furnished by Mr. W. J. Aikens, of Dunnville, is situated in Onondaga township, county of Brant, about five miles from Brantford. Mr. Harold Howell, on whose farm oil was first proved to exist, states that the history leading up to this discovery was as follows:—Years ago small quantities of gas had been found and utilized locally. In 1909 two gas wells were drilled on the Van Sickle farm, south of the oil discovery. Encouraged by this a well was sunk in April, 1910, on the Howell farm, (part of lot 16 in the third concession east of Fairchild's creek), also shown on plan. Some gas was found, but it was not till late in the year that the presence of substantial quantities of oil was proved.

Productive Strata and Probable Importance

The oil is found in the White Medina at a depth of about 550 feet. The wells are drilled with a pocket 100 feet deeper. A small amount of gas is associated with the oil just sufficient to flow the oil in some of the wells for a few months. After this short period all the well owners find it necessary to instal pumps. The best well is said to have made 40 barrels per day for the first 20 days. The quality of the crude oil is good; the specific gravity is about .83. Not much can yet be said as to the probable productivity of the field, as there are no observations extending over more than a few days at any well. It appears that the wells will at the present time produce possibly five barrels or less per day each, but there is not the slightest clue yet as to how long that rate of production will be maintained. The oil is found over an area of 2 by 2½ miles, or 3 square miles. Provided the pore space is up to the average in productive fields, and the thickness of oil-bearing rock is not too small, and there is not an undue proportion of barren rock within the productive area, this area is capable of producing several million barrels of oil.

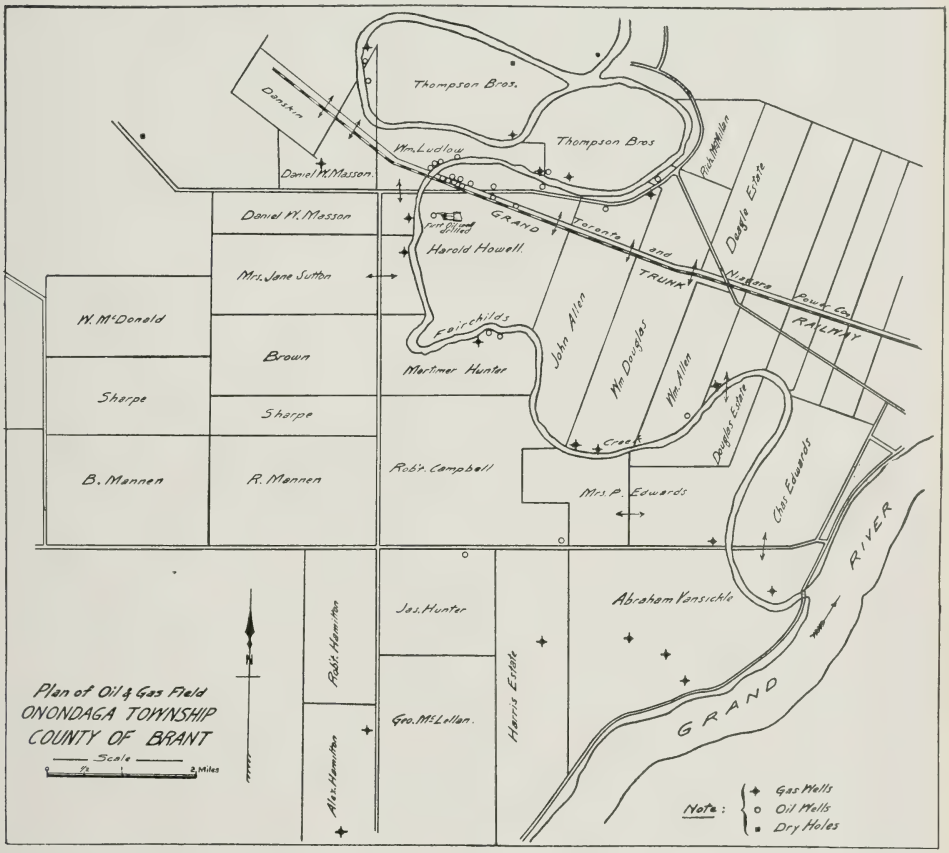
Extent of Operations

The wells are clustered round the Howell farm, on which six have already been drilled. The Mackenzie-Mann Company have drilled six wells on about 1,000 feet in

length of the right of way of the Niagara Power line which runs parallel to the Grand Trunk railway and immediately adjoining it. On the Ludlow farm to the east six wells have been sunk by Aikens & Carmody. About 30 wells in all have been drilled.

In the course of a few months from the present time (May, 1911) it will be known whether any substantial and important production may be expected from the Onondaga field. As the other oil territories in the province have shown a rapidly decreasing yield in the last few years, it will be a welcome addition to our oil resources.

Territory producing natural gas adjoins the oil to the south. The extent or probable value of this cannot be estimated at present.



Natural Gas

If petroleum is declining, natural gas is increasing, in production. In 1909 the output was valued at $1,188,179, while in 1910 it was $1,491,239, an increase of $303,060 or 25.5 per cent. The quantity of gas produced last year is given as 7,263,427 thousand cubic feet, so that the average price at which the yield is valued is 20.5 cents per thousand cubic feet.

The gas-producing territory of Ontario lies on the north and east shores of lake Erie. The several fields have been steadily extending, and appear likely to cover practically the whole of the Ontario side of the lake. At present, there are three separate fields, namely—Welland county, Haldimand and Norfolk counties, and Essex and Kent counties. The last-named was the largest producer in 1910, the Haldimand-Norfolk field next, and Welland county the smallest. Following are the figures pertaining to the natural gas business of 1910:—

Table XIV.—Natural Gas Production, 1910.

Field.	Producing wells. No.	Wells bored in year.		Miles of pipe.	Employees. No.	Wages paid. $	Gas produced. M cu. ft.	Value. $
		Producing.	Non-producing					
Welland	337	33	8	401	67	40,411	1,047,463	278,756
Haldimand-Norfolk	444	103	21	400	71	43,315	2,374,730	676,986
Essex-Kent	47	9	1	181	48	35,059	3,841,234	535,497
Total	828	145	30	982	186	118,785	7,263,427	1,491,239

These figures show that the yield per well is very much greater in the Essex-Kent field than in any of the others, also that the price per thousand cubic feet obtained for the product in that field is considerably less than in either of the others, the average being Welland 26.6 cents, Haldimand-Norfolk 28.5 cents, Essex-Kent 13.9 cents. The consumption of gas in the Haldimand-Norfolk field is largely confined to domestic purposes, being piped to Hamilton, Dundas, Brantford, Galt and other places. The leading producer will sell only for household use.

Mr. Donald Sharpe, Welland, Inspector of wells under 7 Edward VII., chapter 47, whose sphere of operations lies principally in the gas fields of Welland and Haldimand-Norfolk, reports that the producing gas wells drilled in 1910 are distributed by counties as follows:—Haldimand 159, Welland 34, Brant 21, Norfolk 11, Wentworth 5 and Elgin 2. From new gas field at Middleport a new 4-inch main line has been laid across the Indian Reserve to the city of Brantford by the Standard Natural Gas Company. Two first-class wells have been drilled at Vienna and the prospects for the development of a new field here are particularly good for 1911. Drilling for oil will be actively prosecuted in the new oil field in Onondaga township, where two fair oil wells were brought in in 1910 and a third since the new year. All the larger gas companies are active in keeping their wells free from water and in good condition, but a state of affairs requiring special attention arises in cases where companies do not find gas in paying quantities and dispose of the wells to the owners of the premises on which they are situated, and who usually are without knowledge of the proper care of a well.

Mr. G. R. Mickle, Mine Assessor, the duties of whose office bring him into contact with the production of gas and oil, furnishes the following notes respecting developments in the natural gas industry during 1910, including a description of the new field in the township of Bayham:—

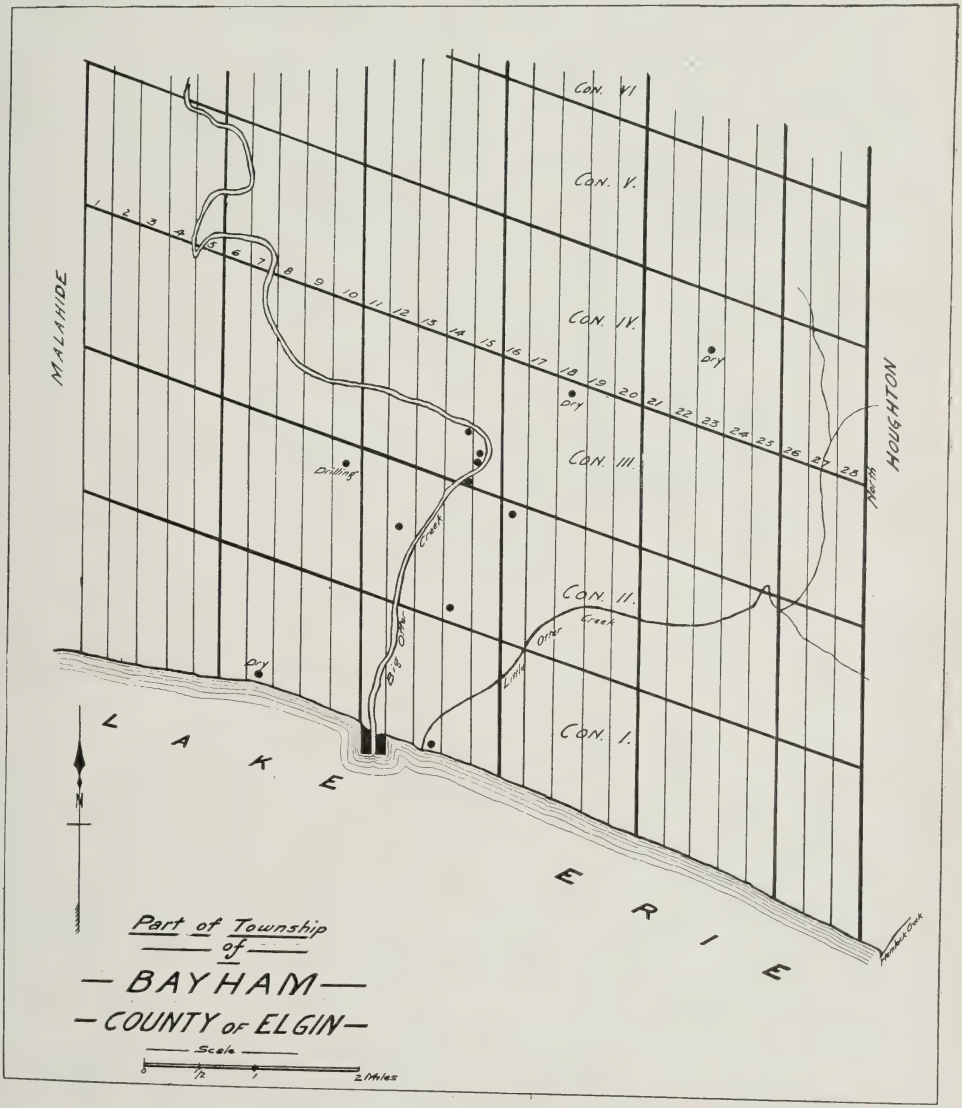
Developments in Natural Gas during the Year

In the past year the main features in connection with the natural gas industry in the Province have been the further development of the Welland-Haldimand-Norfolk field which may now be regarded as one, the discovery of a new productive area in Elgin county, and increased production from the Kent field.

In the first-mentioned field, which is the oldest and most extensive in area, stretching as it does along Lake Erie for about ninety miles and having a depth of probably two to three miles, the development has consisted principally in successful drilling in certain portions which have hitherto been regarded as unproductive or of little value. The field was also extended somewhat to the west. The drain from this territory has been very heavy; although the area is considerable, probably about 200 square miles, the thickness of the gas-bearing rock is usually small, and, in some of the most productive parts, the influence of the heavy production is shown by a very great drop in the rock pressure. The yield must therefore soon diminish. The wells in this field have a small average capacity, being substantially under 200,000 feet per well "open flow" measurement, or probably one-third or one-quarter that amount in actual delivery at the distant points of consumption. As a compensating advantage the depth is not great—about 800 feet—and consequently the expense of drilling is relatively small.

New Field in Elgin County

The newly found field in Elgin county is in the township of Bayham, as shown on attached plan. Only a few wells have been drilled up to April, 1911, and consequently no reliable estimate can be formed of the probable production from this field. As far as tested up to the present, (April, 1911), gas has been found at intervals over a territory of about one and a half miles frontage on the lake by a depth of about



three and a quarter miles, or an area of less than five square miles. Allowing for some extension under the lake, the tested area is probably between one-thirtieth and one-fortieth that of the Welland-Haldimand field and possibly one-sixth that of the Kent field. The thickness of the gas-bearing sand is very variable. As the productive area has not been fully delimited, and the average thickness is not known, and the pore space is, of course, indeterminable, no possible estimate can be made of the amount of gas. Practically no gas has been drawn off up to the present, consequently no information can be gained from the change in rock pressure.

The gas is found in the White Medina sandstone, which appears to be very porous here and favorable for holding large quantities of gas. The pay streak is found at a

depth of a little over 1,300 feet. The rock pressure is about 725 lb., or 48 atmospheres. In all the wells up to the present a heavy flow of water has been encountered at about 300 feet in depth. The amount flowing would probably fill a 3- or 4-inch pipe. A sample of the water tested in the physical laboratory of Toronto University showed the presence of slight traces of radioactive substances dissolved in the water, due, no doubt, to some salt of radium. The amount, however, was less than in the natural gas of Welland county or the petroleum of Lambton county. An analysis of the water showed a minute quantity of potassium, namely, .036 grammes per litre, also the presence of other substances, as follows:—

Sulphur	.203	grammes per litre.
Magnesia	.269	" " "
Lime	.283	" " "

The largest "open flow" measurement recorded at any of these wells is reported to be three million feet in 24 hours, and the smallest in the productive wells about a quarter of a million. In capacity, the wells in Elgin appear to lie intermediate between those of Haldimand and Kent, being greater than the former and smaller than the latter. The nearest towns of importance are Tillsonburg and Aylmer, about 15 miles distant.

Only two companies are operating in the Bayham field, viz.: The Dominion Natural Gas Company, which drilled the first well near the lake east of Port Burwell, and the Medina Natural Gas Company. Those controlling these companies have had long experience in the natural gas business. It is certain that in their hands the field will be energetically and intelligently exploited and that the gas supply will be well conserved.

Estimated Yield of Kent Gas Field

The Kent field was fully discussed in last year's report. No extensions have been made in the area, although the production of gas has increased rapidly. The minimum total ultimate production was given in that report as 61,000 million cubic feet with a probable yield of 90,000 million or more. Operations in the last year confirm the belief that the production may substantially exceed the estimate of probable yield given above.

Following are logs of three of the wells put down in the new Bayham field:

Log No. 1.

Well near Vienna, Bayham township; begun 5 October, 1910, finished 15 December, 1910. William Lauffer, contractor.

Formation	Thickness. ft.	Depth. ft.	Remarks.
Drift	193	193	
Black Shale	5	198	
Flint (very hard)	280	478	Strong flow sulphur water at 260 ft.; also some gas with sulphur water.
Lime (very hard)	447	925	Salt water at 725 ft., with small quantity gas. More salt water at 1,095 ft.
Niagara (very hard)	290	1,215	
Dark Shale (soft)	70	1,285	
Clinton	22	1,307	
White Medina	23	1,330	First gas 1,309 ft.
Red Medina (very soft)	45	1,375	

Log No. 2.

Well drilled on Drake farm, one-half mile east of Port Burwell, by the Dominion Natural Gas Company, Limited.

Formation.	Thickness. ft.	Depth. ft.	Remarks.
Drift	250	250	
Black shale	45	295	
Flint (very hard)	260	555	Heavy flow sulphur water at 300 ft., accompanied by very light showing of oil.
Limestone (very hard)	440	995	Salt water and some sulphur gas at 725 ft.
Niagara	280	1,275	More sulphur gas and small quantity salt water at 1,225 ft.
Dark shale	60	1,335	
Clinton	22	1,357	Big gas.
Red shale (mud)	15	1,372	
White limestone	20	1,392	
White Medina	5	1,397	

Log No. 3.

Wilkin's farm, south end lot 14, concession 2, Bayham township; begun 27 December, 1910, and finished 13 March, 1911. William Lauffer, contractor.

Formation.	Thickness. ft.	Depth. ft.	Remarks.
Drift	255	255	
Black slate	20	275	
Flint	50	325	First gas at 300 feet; sulphur water 320 feet.
Slate	25	350	
Lime	30	380	
Flint	300	680	
Lime	395	1,075	
Niagara	245	1,320	Salt water and sulphur gas at 1,080 ft.; small quantity salt water at 1,135 ft.
Slate	64	1,384	
Clinton	30	1,414	Big gas 1,398 ft.; showing of oil 1,414 ft.
Red shale	7	1,421	

Rock pressure, 745 lb.
Open flow of gas, 750,000 cubic feet.

Minor Products

Numerous mineral substances produced in Ontario not specially dealt with in the foregoing remarks, give rise to many industries of local importance, employing in the aggregate much labor and capital. Most of them are non-metalliferous in character, their production being given in Table I., page 6. Some of them are mentioned below.

Calcium Carbide

Calcium carbide, used in producing acetylene gas for lighting purposes, and made by the fusion of carbon and lime in the electric furnace, is turned out by two companies, the Willson Carbide Company at Merritton, and the Ottawa Carbide Company at Ottawa. Together, these companies produced and shipped 3,072 tons, valued at $184,323. They employed 56 men and paid out $37,630 in wages. The production in 1909 was 2,349 tons.

Corundum

For a number of years the production of corundum has been carried on by the Manufacturers Corundum Company, formerly the Canada Corundum Company, at Craigmont, and the Ashland Emery and Corundum Company at Burgess Mines. The Ashland Company's mines and works were leased by the Manufacturers Company, 1st August, 1910, and consequently passed into the hands of that company, which is at the present time the sole producer of corundum. The quantity taken out and shipped from both mines in 1910 was 1,870 tons of grain corundum, valued at $171,944, or about 4.59 cents per pound. There were 201 men employed at the mines and works, receiving in wages the sum of $100,945.

Feldspar

The production of feldspar went up from 11,001 tons in 1909 to 16,374 tons in 1910, the latter quantity having a value of $47,518. The labor of 107 employees was required, the amount of wages paid being $32,901.

The Kingston Feldspar and Mining Company, of Kingston, and the McDonald Feldspar Company, of Toronto, were the chief producers. The quarries worked by the former company are situated on lot 1 in the second concession of Bedford township, and on the southeast quarter of lot 16 in the eleventh concession of Portland township. The latter company operates a deposit near Verona. All are near the line of the Kingston and Pembroke railway, in Frontenac county. Besides feldspar, these deposits yield quartz or silica, practically pure, occurring in the form of dikes traversing the beds of feldspar. The quartz is used for such purposes as the manufacture of

ferro-silicon, while the feldspar is shipped to pottery trade centres in Ohio and New Jersey. As already mentioned, experiments are now being made at the Ontario Agricultural College, Guelph, with the view of determining the value of finely ground feldspar as a fertilizer. Containing, as they do up to 14 per cent. of potash, these Frontenac county deposits might prove very valuable in increasing the fertility of the farming lands of Ontario, should it be found that the soil has the property of dissolving the potash from the pulverized rock. It can scarcely be doubted that from feldspathic ingredients such as are contained in granite and gneiss, a large proportion of the potash now present in the soil was originally derived. The process of soil formation has, however, been age-long in its duration, and it is to be hoped that the assimilation of the potash in the pulverized feldspar, with its fertilizing virtues, will not be found in the Guelph experiments to demand so generous an expenditure of time, otherwise the benefit to the present and many succeeding generations will be but small.

Graphite

Refined graphite to the extent of 992 tons was produced last year from the mines and works of the Black Donald Graphite Company, Limited, at Whitefish lake, near Calabogie, in the county of Renfrew, and the Globe Refining Company, Limited, at Port Elmsley, in the county of Lanark. The value of the product was $55,637, the number of employees 70, and the amount paid out in wages $40,687. The Virginia Graphite Company are developing a graphite prospect on the south half of lot 35 in the fifteenth concession of the township of Monmouth, and propose to construct a mill having a capacity to treat 200 tons of ore per day. Mr. H. G. Tonkin, Wilberforce, is manager. The graphite occurs in a disseminated condition in limestone.

Gypsum

For many years gypsum has been raised in small quantities in the valley of the Grand river, but the industry has never attained large proportions. The mineral has hitherto been employed mainly in the manufacture of wall plaster, kalsomining preparations, wood fibre, bug poison, as a fertilizer for land, etc., but the development of the Portland cement industry has opened up a considerable outlet and has stimulated production. The admixture of a small proportion of gypsum has the effect of retarding the setting of the cement and so facilitating the manipulation of large quantities at a time. Recent explorations near Caledonia have revealed extensive gypsum deposits, and a new plant for hoisting, crushing and grinding the rock has been installed by The Alabastine Company of Paris. The Caledonia Gypsum Company has also erected a mill for grinding gypsum. This increased activity is not, however, shown in the statistics for 1910, since production on the larger scale did not begin until 1911. There were raised last year 10,043 tons of gypsum, having a value in the crude condition of $17,825. The number of employees was 52, and the payments in wages amounted to $5,062.

Quartz

The hoisting of quartz or silica for a variety of uses is rapidly increasing. Last year there were raised 90,685 tons, valued at $87,424 as against 63,172 tons, worth $75,329 in 1909. The number of men employed was 92 and wages were paid to the extent of $49,382. The nickel mining companies at Sudbury require a large part of the production for the lining of their furnaces. More or less quartz is obtained from the feldspar quarries along the line of the Kingston and Pembroke railway. A new deposit in the township of Conger, near Parry Sound, also shipped a considerable quantity to Welland for use in the electric smelting works at that place producing ferro-silicon.

Talc

Mr. George Gillespie, of Madoc, has established a good business at that place in the grinding of talc, which is raised from a deposit near by. A variety of grades are produced, and a ready market is found for them, not only in Canada,

but also in the United States and Europe, where the material is used in the manufacture of paper, soap, cosmetics, etc. The machinery used in reducing the talc and preparing it for market resembles that employed for the making of flour from wheat. The output in 1910 was 5,824 tons of prepared talc, valued at $46,592. In mining and milling 37 workmen were employed, to whom $15,252 was paid in wages.

Miscellaneous

The manufacture of peat fuel was carried on in 1910 at two places, one at the bog in Alfred township where the Mines Department of the Dominion Government has installed a plant on the Anrep system for making machine peat. The product was sold in Ottawa for domestic consumption, and was in good demand at $3.00 per ton. The other factory was in the township of Dorchester, where a small quantity of pressed fuel was prepared.

A little phosphate of lime was mined in 1910, but none was marketed.

Mr. Thomas Orgill, of Glen Orchard, has discovered diatomaceous earth, otherwise known as tripoli, in the district of Muskoka, in deposits believed to be of workable size and quality. This substance is useful for polishing purposes, and also in the manufacture of nitro-glycerine compounds.

The raising of actinolite was resumed in 1910, after an interruption lasting several years, but only a few tons were produced. Actinolite makes excellent roofing material.

A little fluor-spar was extracted from a deposit near Madoc, and a small quantity was shipped. It is largely used as a flux, and for the extraction of fluoric acid.

Tin was reported from a shaft sunk on indications of lead and zinc in the township of Fitzroy, but the genuineness of the discovery was not sustained by an examination made by the Bureau of Mines.

Mining Revenue

From mining sources the revenue for the year ending 31st October, 1910, was $941,030.09, as compared with $979,464.15 for the previous ten months. The items were as follows:—

1. On account of sales of mining land	$327,160 12
2. do leases do	29,008 79
3. Miners' licenses, permits and fees	193,682 48
4. Mining Royalties	246,529 13
5. Supplementary Revenue Act, 1907	143,209 59
6. Provincial mine	549 77
7. Provincial Assay office	890 21
Total	$941,030 09

Mining Lands

The receipts from sales of mining land include $284,517.08 from purchasers of locations in the Gillies timber limit, the remainder being from persons who, having performed all the work on their claims required by the Mining Act, proceeded to convert their title into a freehold by paying the price per acre demanded by the Act and obtaining a Crown patent. The price of mining lands is $2.50 and $3.00 per acre respectively, for locations in the unsurveyed and surveyed territory.

Mining leases are now only issued for lands included in a Forest Reserve, and a large part of the rental received last year was on account of lands leased for mining

purposes in the silver-bearing areas of Montreal River and Gowganda comprised within the boundaries of the Temagami Forest Reserve. The objection which used to be taken against the leasing provisions of the Mining Act, that capital could not be obtained on the security of a lease, is now seldom heard. The two mines in the Reserve producing silver most freely—the Millerett and the Miller Lake-O'Brien—are held under lease from the Crown. In the following table details are given showing the several districts in which are situated the lands sold or leased during the year. It may be observed that the totals do not agree with those given in the schedule above, the reason being that the figures represent the amounts received by the Department on account of the various transactions, whether paid within the year or previously, while the foregoing table has regard only to actual collections during the year.

Table XV.—Mining Lands Sold and Leased in Year Ending 31st October, 1910

District.	Sales.			Leases.			Total.		
	No.	Acres.	Amount.	No.	Acres.	Amount.	No.	Acres.	Amount.
			$			$			$
Nipissing	325	10,770.31	409,975.35	166	7,959.22	9,182.32	491	18,729.53	419,157.67
Sudbury	29	2,341.53	5,934.86	9	969.64	967.07	38	3,311.17	6,901.93
Thunder Bay	34	1,687.70	4,287.00	....	.....	.....	34	1,687.70	4,287.00
Algoma	27	1,933.52	3,748.32	....	.....	.....	27	1,933.52	3,748.32
Kenora	7	173.88	534.00	....	.....	.....	7	173.88	534.00
Elsewhere	8	369.00	852.00	1	100.00	100.00	9	469.00	952.00
Total	430	17,275.94	425,331.53	176	9,028.86	10,249.39	606	26,304.80	435,580.92

Receipts from sales in the Gillies limit constitute the greater part of the revenue from mining land. The figures would have been larger had not some of the highest bidders declined to proceed with their purchases, forfeiting the ten per cent. of their offers deposited along with their tenders. A balance may now be struck as follows as between receipts and expenditures on account of the Gillies limit lands:—

Receipts:—

Receipts from sale of locations		$492,045 14
Provincial Mine:—		
Sale of ore, etc.	$15,467 38	
Sale of mine	113,111 00	
		128,578 38
Total receipts		$620,623 52

Expenditure:—

Expenses, Provincial Mine and prospecting limit	$94,484 41	
Surplus Receipts over Expenditure		$526,139 11

Miners' Licenses, Permits, and Fees

From the sale of miners' licenses and permits to search for minerals in Forest Reserves, and from fees paid on recording applications for mining claims, etc., the receipts amounted to $193,682.48. This item is strictly in the nature of current revenue, and rises or falls according to the degree of activity shown in prospecting for minerals and speculation in mining lands. The law requires the possession of a current miner's license before mining claims may be validly staked out or recorded, and also in a Forest Reserve a permit to prospect for minerals therein. The transfer of an unpatented mining claim cannot be registered by a Mining Recorder unless the transferee is the holder of a miner's license, and the non-renewal of a license by the recorded holder of a claim is regarded by the law as an abandonment of the claim. The fee for a miner's

license is $5, or if issued after the 1st of October, $3. All licenses expire on 31st March next after their issue. Incorporated companies pay for their licenses according to the amount of their capital stock. For a company whose stock does not exceed $40,000, the fee is $25; if over $40,000, but not exceeding $100,000, it is $50; if over $100,000 but not exceeding $500,000 the fee is $75; if over $500,000, but not exceeding $1,000,000, it is $100, and $100 additional for every additional $1,000,000 of capital, or fraction thereof. The fee for a permit to prospect in a Forest Reserve is $10, and the currency of the permit twelve months. The basis of the charge is the danger arising to the forest from the presence in it of a large number of prospectors, and the necessity of employing a staff of fire rangers to guard against the occurrence and spread of fires.

Mining Royalties

The mines paying a royalty on their output contributed a total of $246,529.13, as follows:—

O'Brien	$61,695 92
Crown Reserve	114,759 11
Hudson Bay	57,962 21
Chambers-Ferland	9,170 85
Hargrave	1,200 00
Waldman	777 48
Wyandoh	963 56
Total	$246,529 13

The O'Brien mine pays a royalty of 25 per cent. on the receipts from sales of ore, less one-fourth of the surface expenses; Crown Reserve, Waldman and Wyandoh, 10 per cent. on the value of the ore at the pit's mouth; Hudson Bay, 15 per cent. on the smelter returns; Chambers-Ferland and Hargrave, 25 per cent. on the profits estimated on the Supplementary Revenue Act basis.

The total amount received as mining royalties up to 31st October, 1910, was as follows:—

O'Brien mine	$536,053 44
Crown Reserve	289,454 42
Hudson Bay (formerly Temiskaming and Hudson Bay)	181,264 27
Chambers-Ferland	16,259 64
Hargrave	2,777 38
Waldman	777 48
Wyandoh	963 56
Total	$1,027,550 19

For the calendar year 1910 the accruals on account of royalties amounted to $342,958.76, all of which except $5,000 was paid within the year.

Supplementary Revenue Act, 1907

Under the provisions of the Supplementary Revenue Act, 1907, there was paid into the Department the sum of $143,209.59, as follows:—

Profit tax	$120,687 54
Natural gas tax	7,127 91
Acreage tax	15,394 14
Total	$143,209 59

The collection of the revenue arising under the above Act is entrusted to the Mine Assessor, Mr. G. R. Mickle, who furnishes the following memorandum, the figures in which, it will be observed, relate to the calendar year 1910, not the fiscal year ending 31st October last:—

The Act imposes three different taxes, viz: (1) Profit tax, being leviable on the profits of mining companies in excess of $10,000, computed, as explained in the Act, at the rate of three per cent. Certain deductions are made for the municipal tax, if any. (2) Natural gas tax, being at the rate of two-tenths of a cent per thousand cubic feet or $2.00 per million on all gas used in Canada. (3) Acreage tax of two cents per acre on all patented or leased mining lands not situated in any municipality. The revenue collected under this Act for the calendar year 1910, amounted to $140,393.21, distributed as follows:—

Profit tax	$111,546 17
Natural gas tax	12,435 99
Acreage tax (April 15, 1910, to April 15th, 1911	16,411 05
Total	$140,393 21

This is about $39,000 in excess of the amount received the previous year and probably marks the limit. The increase in the total is due mainly to the profit tax, which was derived from eleven different companies, mostly in the Cobalt district. Several companies with a large output are under royalty agreements with the Crown whereby the tax when paid is deducted from the royalty. It is simpler to collect as royalty. If the tax were paid and deducted from the royalty, the amount accruing as profit tax would have been greater by about $48,000, and the royalties correspondingly less.

Some revenue seems assured in the future from the operation of mines other than silver or nickel. Gold, iron and pyrites should yield some returns. No substantial increase of the amount derived from profit tax is to be anticipated, however.

The natural gas tax was obtained from thirty-two different companies or producers, and is somewhat smaller than last year, due to the fact that although the actual production has increased, the amount exported or wasted, on which the tax is at a higher rate than on gas used in Canada, has been reduced to a very small amount, and before the end of the year 1909 (on which the tax is based) ceased altogether. Returns may be expected to show an increase for several years, owing to the heavier production from the Kent gas field and the opening of new territory in Elgin county.

The acreage tax was greater in 1910 than it has been in the past or will perhaps ever be again, as a considerable amount is due to back taxes collected before the 15th September, 1910, which was the last date fixed for payment of taxes on lands advertised as two years or more in arrears. The total number of acres thus advertised was about 247,000; of this 141,000 acres remained in arrears at the expiration of the time in which payment might be made and were consequently forfeited. This constitutes about 16 per cent. of the land which is taxable under the Act, and was contained in about 1,600 parcels. The percentage of area of taxable land thus forfeited is about the same in all the different districts, but the aggregate in the western part of the Province is much greater. This is due to the fact that most of the mining land in the western districts was granted before 1892 when the units of area were larger, and moreover not so many municipalities have been formed in that part, the land therefore remaining taxable by the Province, not by the municipalities.

In spite of the great mining activity in the northeastern part of Ontario the number of acres on the tax roll is not likely to increase. The land may be held three years without patenting and a very large percentage of the claims will be allowed to lapse. Moreover, wherever mining meets with success, municipalities will be formed and the power to tax will be transferred to the municipalities.

Mining Companies

In 1910 162 mining companies were incorporated under the laws of Ontario with an aggregate authorized capital of $128,999,300, as compared with 282 companies, having a capital of $236,883,000 in 1909. As will be seen by the list given below, the centre of company-making activity has been changed, and "Porcupine" is now the word to charm with, instead of "Cobalt."

Fourteen extra-Provincial corporations were granted license to carry on business in Ontario.

Table XVI.—Mining Companies Incorporated in 1910.

Name of Company.	Head Office.	Date of Incorporation.	Capital.
Aberdeen Ontario Syndicate, Limited	Toronto	Nov. 18, 1910..	$20,000
Alice, Lorraine Mines, Limited.	Haileybury	May 7, 1910....	1,500,000
Amalgamated Porcupine Gold Mines, Limited	Toronto	Oct. 4, 1910....	500,000
Atlas Mines, Limited	Toronto	Jan. 31, 1910....	1,500,000
Big Creek Natural Gas Company, Limited	Hamilton	Jan. 6, 1910....	200,000
Big Tooth Gold & Silver Mine, Limited	Toronto	July 20, 1910....	40,000
Bobs Creek Mines, Limited	Toronto	Feby. 23, 1910..	2,000,000
Bosancas Cobalt Mines Limited	Orillia	Feby. 5, 1910....	1,000,000
Boston Development Company, Limited	Toronto	Dec. 6, 1910.....	100,000
Bradley-Donaldson Mines Limited	Ottawa	Sept. 13, 1910...	1,000,000
Bremner Porcupine Mines, Limited	Toronto	Nov. 16, 1910...	1,000,000
British North American Exploration Company, Limited..	Toronto	April 16, 1910..	200,000
Bull Dog Mining Company, Limited	Toronto	April 18, 1910...	1,000,000
Canada Pebble Company, Limited	Port Arthur	Aug. 24, 1910...	40,000
Canadian Porcupine Exploration Company, Limited	Toronto	Nov. 10, 1910...	40,000
Canadian Sulphur Ore Company, Limited	Toronto	May 18, 1910...	40,000
Church Lake Silver Mine, Limited	Hamilton	Mar. 10, 1910...	1,100.0
Cleveland Gow Ganda Mines, Limited	Toronto	Feby. 15, 1910...	40,000
Crown Chartered Gold Mining Company of Porcupine Lake, Limited	Toronto	Feby. 11, 1910...	2,000,000
Cyril Lake Mining Company, Limited	Toronto	Jan. 6, 1910....	2,000,000
Development Company of Porcupine, Limited	Toronto	Dec. 2, 1910....	1,000
Deville Mines Company, Limited	Toronto	April 7, 1910....	2,000,000
Dobie Reeves Silver Mines, Limited	Toronto	July 15, 1910...	500,000
European Process Peat Company, Limited	Toronto	Mar. 3, 1910....	75,000
Gas Producer Company, Limited	Toronto	Aug. 2, 1910....	1,000,000
Goldfields, Limited	Toronto	Mar. 14, 1910...	3,000,000
Gray Porcupine Mining Company, Limited	Toronto	Oct. 3, 1910....	40,000
Great North Mines, Limited	Toronto	Feby, 12, 1910...	40,000
Great Western Cement & Gravel Company, Limited	Toronto	April 26, 1910...	250,000
Halton Brick Company, Limited	Toronto	July 25, 1910...	200,000
Harris Consolidated Mines, Limited	Toronto	Mar. 14, 1910...	40,000
Harris Mines, Limited	Toronto	Jan. 4, 1910....	2,000,000
Hecla Silver Mines, Limited	Toronto	June 8, 1910....	200,000
Home Natural Gas Company, Limited	Hamilton	July 28, 1910...	40,000
Homestake Mining Company, Limited	Gowganda	May 5, 1910....	500,000
Hollinger Gold Mines, Limited	Toronto	June 28, 1910...	3,000,000
H. R. 94, Limited	Windsor	May 2, 1910....	40,000
Iris Mining Company, Limited	Windsor	Jan. 14, 1910...	500,000
Jack Fish Mines, Limited	Toronto	Dec. 1, 1910....	500,000
John Mann Brick Company, Limited	Brantford	Mar. 2, 1910....	75,000
King Porcupine Mines, Limited	Toronto	Nov. 1, 1910....	500,000
Lake Superior Silver Mines, Limited	Sault Ste Marie	Jan. 25, 1910...	600,000
Lincoln Mines, Limited	Hamilton	May 17, 1910....	300,000
Loon Lake Silver Mines, Limited	Haileybury	Sept. 29, 1910...	1,000,000
Merger Mines, Limited	Toronto	Jan. 31, 1910...	3,000,000
Miller Porcupine Gold Mines, Limited	Haileybury	Feby. 23, 1910...	2,000,000
Mines and Stocks, Limited	Toronto	Dec. 9, 1909....	40,000
Moneta Porcupine Mines, Limited	Toronto	Oct. 14, 1910...	1,000,000
Monmouth Granite Quarries, Limited	Toronto	Mar. 5, 1910....	50,000
Montreal and Porcupine Mining Company, Limited	Porcupine	Aug. 4, 1910....	1,000,000
Montreal Tisdale Gold Mines, Limited	Sault Ste Marie	Dec. 31, 1910...	2,000,000
National Gold Mines, Limited	Ottawa	April 5, 1910...	1,500,000
North American Smelting Company, Limited	Kingston	Mar. 1, 1910....	500,000
Northland Mining and Prospecting Company, Limited	Toronto	Mar. 22, 1910...	100,000
North Shore Gas Company, Limited	Hamilton	Nov. 4, 1910....	100,000
Ojaipee Silica-Feldspar, Limited	Toronto	Sept. 15, 1910...	40,000
Old Glory Cobalt Silver Mining Company, Limited	Toronto	Jan. 4, 1910....	500,000
Ontario Fidelity Mines, Limited	Toronto	Oct. 24, 1910....	500,000
Ontario-Guibord Mining Company, Limited	Toronto	April 12, 1910...	100,000
Ontario Iron Ores, Limited	Toronto	May 19, 1910...	40,000
Ontario Northern Mines, Limited	Sault Ste Marie	Oct. 5, 1910....	100,000
Pearl Lake Gold Mines, Limited	Haileybury	Oct. 28, 1910...	2,500,000
Phœnix Consolidating Mining Company, Limited	Ottawa	April 29, 1910...	1,000,000
Porcupine Bullion Company, Limited	Toronto	May 23, 1910...	50,000
Porcupine Central Mining Company, Limited	Ottawa	Nov. 17, 1910...	1,000,000
Porcupine Consolidated Mining Company, Limited	Toronto	Jan. 13, 1910...	40,000
Porcupine Development Company, Limited	Haileybury	Feby. 15, 1910...	100,000
Porcupine Exploration Syndicate, Limited	Toronto	Mar. 11, 1910...	50,000
Porcupine Goldfields, Limited	Toronto	Jan. 5, 1910....	500,000
Porcupine Gold Milling Company, Limited	Toronto	Dec. 6, 1910....	500,000
Porcupine Gold Reef Mining Company, Limited	Toronto	Jan. 10, 1910....	1,000,000
Porcupine Imperial Gold Mines, Limited	Toronto	Dec. 21, 1910...	40,000
Porcupine Three Nations Gold Mining Company, Limited	Ottawa	Nov. 2, 1910....	1,500,000
Porcupine Tisdale Mining Company, Limited	Cobalt	Feby. 11, 1910...	2,000,000
Punxrutawney Mining and Development Company, Limited	Toronto	April 9, 1910....	500,000
Purity Silver Mines, Limited	Toronto	Jan. 10, 1910....	1,000,000
Quigley's Mines, Limited	Toronto	April 23, 1910...	200,000
Rea Mines, Limited	Toronto	Nov. 11, 1910...	40,000
Reliance, Limited	Toronto	Feby. 8, 1910....	40,000
Ridgley Porcupine Mines, Limited	Toronto	May 25, 1910...	500,000
Royal Westmount Mines, Limited	Elk City	June 25, 1910...	2,000,000

Table XVI —Continued

Name of Company.	Head Office.	Date of Incorporation.	Capital.
Rubies, Limited	Toronto	Mar. 31, 1910...	2,500,000
Schumacher Brick and Tile Company, Limited	Toronto	Mar. 18, 1910...	100,000
Silver Country Mines Consolidated, Limited	Toronto	Mar. 2, 1910....	2,000,000
Silver Dollar Mining Company, Limited	Owen Sound ...	April 15, 1910...	1,000,000
Silver Nugget Mines, Limited	Haileybury	Jan. 12, 1910...	1,000,000
Sociate Mines, Limited	Toronto	Dec. 23, 1910...	150,000
South Tisdale Gold Mining Company, Limited	Toronto	Oct. 28, 1910...	3,000,000
Standard Gold Mines, Limited	Haileybury	Mar. 18, 1910...	1,500,000
Standard Natural Gas Company, Limited	Brantford	Oct. 7, 1910....	50,000
Stewart Mines, Limited	Toronto	July, 19, 1910...	1,000,000
Strand Mining Company, Limited	Toronto	Mar. 3, 1910....	1,000,000
Superior Mining Company, Limited	Ottawa	Nov. 24, 1910...	20,000
Suroff Feldspar Mining and Milling Company, Limited	Toronto	Mar. 8, 1910....	150,000
The A 91 Mining Company, Limited	Toronto	Mar. 18, 1910...	33,300
The Auerbach Mining Company, Limited	Haileybury	May 2, 1910....	2,500,000
The Bannock Lake Mining Company, Limited	Sudbury	Mar. 17, 1910...	500,000
The Bannerman Mining Syndicate, Limited	Haileybury	Sept. 7, 1910...	100,000
The Black Prince Graphite Mining Company, Limited	Ottawa	Oct. 26, 1910....	50,000
The Boreal Mining Company, Limited	Toronto	Aug. 4, 1910....	100,000
The Brantford Mining Company, Limited	Brantford	Jan. 12, 1910...	500,000
The Canada Slate Company, Limited	Toronto	Jan. 27, 1910...	500,000
The Canadian Consolidated Mining, Lumber and Utilities Company, Limited	Toronto	April 30, 1910...	4,000,000
The Canadian Calcium Carbide, Limited	Niagara Falls ...	Mar. 5, 1910 ..	600,000
The Carrie Handcock Mining and Development Company, Limited	Kenora	May 4, 1910....	100,000
The Central Porcupine Gold Mines, Limited	Toronto	Sept. 12, 1910...	1,000,000
The Chelmsford Coal, Gas and Oil Company, Limited	Chelmsford	Aug. 31, 1910...	500,000
The Cobalt Frontenac Mining Company, Limited	Hamilton	Nov. 20, 1910...	2,000,000
The Dome Mines Company, Limited	Toronto	Mar. 23, 1910...	2,500,000
The Dominion Salt Company, Limited	Sarnia	April 12, 1910..	100,000
The Dominion Zinc and Mineral Mining Company, Limited	London	April 4, 1910...	300,000
The Dorchester Peat Company, Limited	London	Aug. 29, 1910...	75,000
The Dudhope Mining and Milling Company, Limited	Hastings	Mar. 15, 1910...	500,000
The East Dome Syndicate, Limited	Toronto	Nov. 23, 1910...	1,000,000
The Enterprise Gas Company, Limited	Delhi	May 3, 1910....	100,000
The Golden Horse Shoe Mining Company, Limited	Toronto	May 23, 1910...	2,000,000
The Great Eastern Porcupine Gold Mines, Limited	Ottawa	June 10, 1910...	1,000,000
The Haliburton Gold Mining Company, Limited	Windsor	Nov. 1, 1910....	1,000,000
The Island Smelting and Refining Company, Limited	Toronto	April 22, 1910...	3,000,000
The Kenora Mines, Limited	Kenora	June 20, 1910...	500,000
The Lakeview Mining Company of Cobalt, Limited	Cobalt	Sept. 22, 1910...	1,000,000
The Legris Silver Mines, Limited	Toronto	July 13, 1910...	1,500,000
The Leroy Lake Syndicate, Limited	Haileybury	Mar. 12, 1910...	1,000,000
The Lone Pine Gold Mining and Milling Company, Limited	Dryden	Aug. 11, 1910...	300,000
The Lucky Volunteer Gold Mining Company, Limited	Toronto	Nov. 30, 1910...	100,000
The Manufacturers' Natural Gas Company, Limited	Hamilton	'eby. 24, 1910...	1,000,000
The Maple Camp Mining Company, Limited	Sault Ste Marie	an. 22, 1910....	75,000
The Marathon Silver Mine, Limited	Haileybury	Mar. 12, 1910...	1,500,000
The M. & H. mining and Development Company, Limited	Ottawa	Feby. 8, 1910...	500,000
The Metropolitan-Cobalt Mining Company, Limited	Haileybury	July 29, 1910...	2,500,000
The Millcrest Mining Company, Limited	Toronto	May 19, 1910...	1,000,000
The Menes Mines, Limited	Sault Ste Marie	Nov. 29, 1910...	3,000,000
The Nipigon Hermatite Ore Company, Limited	Nipigon	Jan. 13, 1910...	1,000,000
The Nipissing Extension Mining Company, Limited	Toronto	April 22, 1910...	500,000
The Ontario Lorrain Mining Company, Limited	Toronto	Jan. 12, 1910...	1,000,000
The Opportune Oil and Land Company, Limited	Petrolia	Mar. 8, 1910....	50,000
The Ox-Bow Mining Company, Limited	Haileybury	June 13, 1910...	2,500,000
The Pergola Sulphur Mining Company, Limited	Hamilton	Oct. 14, 1910...	400,000
The Pinder Exploration Company, Limited	Toronto	Feby. 7, 1910...	100,000
The Producers Natural Gas Company, Limited	Hamilton	Oct. 7, 1910....	200,000
The Quartz Lake Silver Mining Company, Limited	Haileybury	Feby. 8, 1910...	500,000
The Rockwood Lime and Stone Company, Limited	Rockwood	June 6, 1910...	40,000
The Roscoe Mining Company, Limited	Toronto	Aug. 30, 1910...	100,000
The Ross-Ballard Mines, Limited	Renfrew	Jan. 12, 1910...	1,000,000
The Ryan-Gillies Silver Mining Company, Limited	Cobalt	Mar. 23, 1910...	1,750,000
The Standard Brick Company, Limited	Toronto	May, 4, 1910....	25,000
The Steelton Brick and Tile Company, Limited	Sault Ste Marie	July 12, 1910...	100,000
The Success Gold Mines Company, Limited	Porcupine	Oct. 3, 1910....	900,000
The Tiffin Oil and Gas Company, Limited	Havelock	April 11, 1910..	50,000
The United Counties Oil and Gas Company, Limited	Sarnia	Mar. 27, 1910...	40,000
The Vermilion River Gold Dredging Company, Limited	Toronto	Aug. 11, 1910...	1,000,000
The Vipond Porcupine Mines, Limited	Toronto	Mar. 29, 1910...	50,000
The Wellandport Natural Gas Company, Limited	Wellandport	June 9, 1910...	10,000
Tisdale Central Mines of Porcupine, Limited	Toronto	Dec. 14, 1910...	40,000
Tisdale Gold Mining Company, Limited	Toronto	Oct. 1, 1910....	500,000
United Nickel-Cobalt Company, Limited	Sudbury	Sept. 28, 1910...	40,000
United Porcupine Gold Mines, Limited	Toronto	Feby. 10, 1910...	1,500,000
Valentine Mines, Limited	Ottawa	Mar. 29, 1910...	1,500,000
Veteran Gold Mining Company, Limited	Toronto	Feby. 14, 1910...	250,000
Welch Mines, Limited	Toronto	May, 18, 1910...	1,000,000
Wentworth Gas Company Limited	Hamilton	Nov. 29, 1910...	500,000
Willet Cobalt Mining Company, Limited	Toronto	Dec. 1, 1909....	2,000,000
Total Authorized Capital			$128,999,300

Table XVII.—Mining Companies Licensed in 1910.

Name of Company.	Head Office.	Date of License.	Capital.
Benson Cobalt Smelting and Refining Company, Limited	Toronto	Sept. 27, 1910...	$40,000
Canadian Oil Producing and Refining Company, Limited	Toronto	July 29, 1910 .	£75,000
Duncan Lake Mining Company	Toronto	Feby. 24, 1910...	$100,000
London and Gowganda Exploration Company, Limited .	Toronto	April 8, 1910....	£200,000
National Paving and Contracting Company	Port Arthur	July 15, 1910...	$100,000
Russell Shale Brick Company, Limited	Russell	Sept. 5, 1910....	.....
Scottish Ontario Gold Mining Syndicate, Limited	Toronto	Mar. 23, 1910...	£5,000
Standard Oil Company of Canada	Toronto	Sept. 5, 1910....	£60,000
La Compagnie Miniere de la Vallee du St. Maurice, Limited	Cobalt	April 7, 1910....	$250,000
The British American Oil Company, Limited	Toronto	Dec. 27, 1910...	.....
The Columbian Oil and Gas Company of Canada, Limited	Toronto	July 15, 1910...	.....
The Pacific Coast Exploration Company, Limited	Toronto	May, 31, 1910...	.....
The Powerful Mining Company	Latchford	April 7, 1910...	75,000
United Cobalt Exploration Company	Guelph	May 31, 1910...	1,000

Mining Divisions

The only change in the Mining Divisions in 1910 was the creation of a new Division at Porcupine to accommodate the prospectors who began staking claims in the gold area there during the autumn of 1909. Parts of the Temiskaming, Sudbury and Montreal River Mining Divisions were combined to form the Porcupine Division, the date of the Order in Council creating the same being 27th January, 1910. Early in 1911 it became evident that the convenience of the mining community along the line of the T. & N. O. railway near the height of land would be better met by an office on the railway which would be within reach of prospectors on both sides of the line, than by the office at Larder lake, situated in the southeastern portion of the territory. Consequently the Larder Lake Division was considerably enlarged by adding to it a portion of the Temiskaming Division, and the Recorder's office was removed to Matheson. The date of the Order in Council making these changes was 13th March, 1911. Following is a description of the tract added to the old limits of the Larder Lake Division:

Commencing at the northeast angle of the Township of Otto, on the Temiskaming and Northern Ontario Railway in the District of Nipissing; thence west astronomically along the north limit of said township and along the north limit of the Township of Eby, 12 miles to Ontario Land Surveyor, T. B. Speight's, meridian line as run in 1902; thence north astronomically along said meridian line 18 miles to the southeast angle of the Township of Playfair; thence west astronomically along the south boundary of said township and along the south boundary of the Townships of McCann, Egan, and Sheraton 24½ miles more or less to the southwest angle of the latter; thence north astronomically along the west boundary of the Townships of Sheraton, Bond and Stock, 18 miles, to the southeast angle of the Township of Dundonald; thence west astronomically along the south boundary of the Township of Dundonald 6 miles to the southwest angle thereof; thence north astronomically along the west boundary thereof 6 miles to the northwest angle thereof; thence east astronomically along the north boundary of the Townships of Dundonald, Clergue, Walker, Wilkie, Coulson, Warden and Milligan 42½ miles more or less to the northeast angle of the latter; thence north astronomically ten chains more or less to the south shore of Lower Abitibi Lake; thence northeasterly easterly and southerly along the south shore of said Lower Abitibi Lake and along the west shore of Biederman's Narrows to Upper Abitibi Lake; thence easterly, northeasterly and southeasterly along the north shore of said Upper Abitibi Lake to the Interprovincial boundary between the Provinces of Ontario and Quebec; thence south astronomically along said Interprovincial boundary 22 miles more or less to Ontario Land Surveyor, J. J. Newman's, base line as run in 1907, which base line intersects the Interprovincial boundary as a point 27 chains 53 links north of the 61st mile post thereon measured north from Lake Temiskaming; thence west astronomically along said base line 22¾ miles more or less to the northeast angle

of the Township of Barnet; thence south astronomically along the east boundary of said township 6 miles to the southeast angle thereof; thence west astronomically along the south boundary of said township 24 chains 88 links to Ontario Land Surveyor, J. J. Newman's, meridian line as run in 1907; thence south astronomically along said meridian line 18 miles more or less to the place of beginning. Saving and excepting therefrom the Abitibi Indian Reserve containing 20 square miles more or less lying to the east of the Townships of Milligan and McCool: said territory including the surveyed Townships of Dundonald, Clergue, Walker, Wilkie, Coulson, Warden, Milligan, McCool, Munro, Beatty, Carr, Taylor, Stock, Bond, Currie, Bowman, Hislop, Guibord, Michaud, Barnet, Cook, Playfair, McCann, Egan, Sheraton, Benoit and Maisonville.

The Recorder's office at Cobalt having served the purpose for which it was established, and the mining lands in the original Cobalt area being practically all taken up and a large proportion of them patented, an Order in Council was passed on the 10th January, 1911, attaching the special Mining Division of the township of Coleman to the Temiskaming Mining Division, and removing the head office to Haileybury, where it was placed in charge of Mr. George T. Smith, the Recorder for the Temiskaming Division. The change took effect 1st February, 1911.

Following is a list of the Mining Divisions with the name and post-office address of the Recorders and a statement of the moneys taken in at the various offices during the year ending 31st October, 1910:—

Table XVIII.—List of Mining Divisions, 1910.

Mining Division.	Name and P.O. Address of Recorder.	Receipts.			Total receipts.
		Purchase money.	Miners' licenses.	Recording fees, etc.	
		$	$	$	$
Kenora	W. L. Spry, Kenora	1,412 26	838 00	1,287 25	3,537 51
Port Arthur	J. W. Morgan, Port Arthur	4,250 25	1,966 25	4,712 60	10,929 10
Sault Ste. Marie	S. T. Bowker, Sault Ste. Marie	4,538 55	1,849 00	1,995 00	8,382 55
Sudbury	C. A. Campbell, Sudbury	1,443 39	4,016 00	16,189 50	21,648 89
Montreal River	A. Skill, Elk Lake	5,540 58	4,525 00	6,338 25	16,403 83
Gowganda	H. E. Sheppard, Gowganda	736 03	3,468 00	11,308 42	15,512 45
Temiskaming	G. T. Smith, Haileybury	13,834 60	20,278 60	40,300 25	74,413 45
Larder Lake	J. A. Hough, Matheson	4,402 12	663 00	1,399 00	6,464 12
Parry Sound	H. F. McQuire, Parry Sound	400 00	447 00	348 00	1,195 00
Porcupine	A. E. D. Bruce, Porcupine	2,755 50	4,160 00	17,548 92	24,464 42
Coleman	G. T. Smith, Haileybury	3,382 01	8,852 00	1,889 00	14,123 01
	Totals	42,695 29	51,062 85	103,316 19	197,074 33

For those portions of the Province not included in any Mining Division having a local Recorder's office, the Deputy Minister of Mines acts as Recorder at the Department, Toronto. Here there were received during the fiscal year on account of purchase money $294,714.22, for miners' licenses $32,996.64, and for recording fees $6,306.80.

The several Mining Recorders report shortly on the business of their offices for the year ending 31st December, 1910, in the following terms:—

Kenora

During the year there were issued from this office 105 miner's licenses, 74 renewal licenses, 89 certificates of work, 27 certificates of record; 91 mining claims and 4 quarry claims were recorded; 83 transfers were registered, 2 working permits issued, 2 disputes filed and disposed of, and 17 applications for mining patents received and dealt with.

The actual business of the year has been light, yet much office work was necessary. From a mining standpoint the district has been inactive, but with the opening up of the Mikado gold mine and several others in the district, and the throwing open of dozens of mining claims that have been tied up for years, interest will, no doubt, be revived. Recorder, W. L. Spry.

Port Arthur

During the year ending December 31st, 1910, 211 miner's licenses and 320 renewals of licenses were issued, and 207 mining claims recorded.

Seventeen applications from Rainy River district were received in this office, and together with the recording fee of $170.00 were forwarded to the Bureau of Mines; 21 applications for claims in Sault Ste. Marie mining division, together with the recording fees, were forwarded to the Recorder at Sault Ste. Marie; and 16 applications for claims in the Kenora division were received and forwarded to the Recorder at Kenora, together with the necessary fees.

The excitement caused by discoveries of rich gold-bearing veins in the region of Sturgeon lake has somewhat abated, but still considerable prospecting is being carried on and a number of rich lodes have recently been discovered.

There have been no discoveries of much importance in new territory, but a large amount of development work has been performed. Several disputes have been settled during the year. Recorder J. W. Morgan.

Sault Ste. Marie

Miner's licenses issued, 142; renewals, 234; mining claims recorded, 181. Recorder, S. T. Bowker.

Sudbury

In the year 1910 miner's licenses issued numbered 409, renewals, 404; mining claims recorded 1,131; there were 67 applications for boring permits.

This is a falling off of 728 claims in comparison with last year. The reason for this is the opening of the Porcupine Mining Division, which took away the territory from the Sudbury Division. Also the discovery of gold in that region has diminished the interest in silver. In the region along the Wahnapitae river in the Reserve, which last year was quite active, there has been very little staking, although many of those who have previously staked do not seem to have lost confidence, and are keeping up their assessment work fairly well.

The new features this year are the staking of iron on the Mattagami river near Grand Rapids. Some more iron ore has lately been staked in the township of Olrig, in Hugel township a number of gold claims, and some iron in Berth 10.

Staking for gold has lately begun to the south and southwest of Porcupine Mining Division, some in the Temagami Reserve and some outside. Recorder, C. A. Campbell.

Montreal River

Miner's licenses issued 247, renewals, 518; mining claims recorded, 344; certificates of record granted 133, ditto work 193.

The work of developing the mining land of the Montreal River Mining Division has not been carried on with the same energy that marked the period of 1909, but those remaining in the district are still of the opinion that it will eventually produce a large quantity of valuable mineral. The counter attractions provided in the Porcupine camp have joined with the operations of unscrupulous speculators in producing the depression which usually follows a mining boom. The stringency of the money market and the hesitancy of capital to invest in mining ventures has confined the work of development in this Division to an area which is considerably smaller than the one worked a year ago, but the optimists who have remained secured very gratifying results during the past summer. The section around Hubert lake and the township of Willet may be particularly mentioned in this connection. The finds on the Currie properties at Hubert lake, the showing on the Clawson and the Mapes-Johnson at Silver lake, and the satisfactory results of the work on the Tee Arr Mining Company's property make that district look very desirable. Financial difficulties have occasioned the discontinuance of work on the Gavin-Hamilton, Mother Lode, Royal Westmount and Lucky-Godfrey claims, but most of the others in this vicinity are preparing

to carry on extensive operations during the coming year. This, coupled with the development of the new finds that have been made in Willet, James and Tudhope should enable investors to arrive at a satisfactory estimate of the value of the district during the coming summer. Recorder, Albert Skill.

Gowganda

The following is a report of the work done by this office during the year ending the 31st December, 1910:—

Licenses issued, 200; licenses renewed, 477; certificates of record issued, 147; certificates of performance of work issued, 255; claims recorded, 513. Recorder, H. E. Sheppard.

Temiskaming

The amount of business transacted in the Temiskaming Mining Division for the fiscal year ending 31st October, 1910, has been satisfactory. Between the 1st November and 31st December, 1909, 399 miner's licenses were issued; 18 miner's licenses renewed, and 1,021 applications for mining claims recorded. From 1st January to 31st October, 1910, 1,275 licenses were issued; 2,053 licenses renewed, and 2,028 applications for mining claims recorded, forming a total of 1,674 licenses issued, 2,071 licenses renewed, and 3,049 applications for mining claims recorded during the twelve months.

Discoveries reported from widely intervening points show that the boundaries of the recognized mineral area are constantly extending, and the coming season is likely to be a record one.

Development work all over the Division has been very actively carried on, and the results on the whole have been gratifying. While the Porcupine gold fields have to a great extent overshadowed all other mining camps in this section, the idea prevails—and recent occurrences go to strengthen it—that Porcupine has not a monopoly of the precious metal. Beatty, Bryce, Munro and Otto all seem to have something above mere pretensions to becoming gold camps, and the country west of Holmes is also an aspirant for similar honors.

Some promising discoveries have been made in the South Lorrain and Metabitchewan districts, and while the Wettlaufer is the only steady shipper, it is said that ere long other properties will likely be included in the list. Extensive development work was carried on on the Lang-Caswell properties in Lorrain, and while no ore has been shipped, things are said to look very promising.

The Green-Meehan mine in Bucke has renewed operations, and a couple of other properties adjacent to North Cobalt, which for some time have been dormant, will likely resume operations shortly. Recorder, Geo. T. Smith.

Larder Lake

The business transacted in this office during 1910 comprised 84 applications, 58 transfers, 1 agreement, 65 certificates of record, 73 certificates of performances of working conditions, 1 dispute, 4 appeals to Mining Commissioner, two transfers of mining partnership shares, 90 renewal licenses, 21 miner's licenses, 2 substituted licenses; 58 claims were purchased. Recorder, J. Atwell Hough.

Parry Sound

Twenty-six claims were recorded during the year, for gold, copper, feldspar, silica, mica and iron. From lot 4, concession 9, Conger, some shipments of silica have been made to Welland and Hamilton. Samples of mica shown from the townships of Ferguson and McConkey are very promising. Little or no effort has been made to open these deposits on account of lack of transportation. Iron properties in the township of Lount are being prospected by American parties. Recorder, H. F. McQuire.

Porcupine

Six hundred and fifty-nine miner's licenses and 420 renewals were issued in 1910, a number of transfers, agreements, etc., were recorded; also 2,150 applications for mining claims. Recorder, Arthur E. D. Bruce.

Coleman

In 1910 609 miner's licenses and 977 renewals were issued; 40 claims were recorded. Recorder, T. A. McArthur.

Diamond Drills

For several years the Department maintained two diamond drills which were placed at the disposal of persons who wished to explore mining lands or mineral deposits by boring. It having become apparent that there were now in private hands a sufficient number of drills to serve all such requirements, both the drills were disposed of, and the Department is no longer in a position to undertake work of this kind.

Provincial Assay Office

The following report on the work of the office for 1910 is submitted by Mr. N. L. Turner, Provincial Assayer:—

The Provincial Assay Office was established in July, 1898, by the Ontario Government as an aid to the mineral development of the Province. The office has rendered many services for the public, as is shown by the large number of assays and analyses made. The rates are sufficiently low to allow prospectors and others to have their finds examined at small cost. The office is well fitted with assay and analytical apparatus for the testing of the various ores and minerals which are distributed so widely throughout the Province.

The past year has been a busy one in this office, a large number of samples having been received from all parts of Canada and various parts of the United States. During the summer numerous samples of limestone were received from Quebec. These were examined as to their suitability for the manufacture of cement. A number of similar samples were also received from Newfoundland.

There appears to be a renewed interest in the northern part of Hastings county, judging from the numerous inquiries which were received for information regarding deposits of mica, feldspar, fluorite, etc., in that part of the Province. Probably the greatest need here is good transportation facilities.

As usual, a large number of samples were received from the Cobalt, Porcupine and Sudbury districts.

During the year 1,138 samples were assayed and analyzed in whole or part and reports as to commercial value issued. The total fees collected and transmitted to the Provincial Treasurer amounted to the sum of $1,265.84, and the value of the work performed for the Bureau of Mines amounted to $899.25 (this figure only includes the actual value in assays of samples), making a total of $2,165.09.

The work for the public consisted of:—

(*a*) Issuing reports consisting of assays, analyses, and identification of samples submitted.

(*b*) Supplying information, where possible, to owners of mineral land who desired to know of probable purchasers, and also advising as to uses, value, etc., of their minerals.

The work for the Bureau of Mines consisted of:—

(*a*) Sampling and assaying of car lots of cobalt-silver ore from the several Cobalt mines paying royalty to the Crown, shipped to the various reduction works.

(*b*) Sampling and analysing of shipments of cobalt oxide from the different smelters on which the Government grants a bounty.

(*c*) Analyses and assays of various samples submitted by members of the Government geological staff.

(*d*) Rock analyses of samples sent in by the Provincial Geologist and members of his staff.

Instructions as to Samples

The following instructions are for the benefit of those who desire to send in samples for examination—

Crushed samples, representing the average of large quantities or samples less than 5 lbs. in weight, may be sent by mail as 3rd class matter (two cents for the 1st four ounces or fraction thereof, and one cent for each additional two ounces.) Write your own name and address plainly on the parcel and send instructions with money in payment of fees in a separate letter. When more than one sample is sent at one time, each sample must be distinctly marked or numbered, so that they may be identified by instructions in letter. Samples may be sent per express, charges prepaid.

Sample bags addressed to this laboratory for sending ore pulp by mail may be obtained free on application, also canvas bags for shipping ore.

Each determination made in the laboratory is checked off by a duplicate when sufficient material is sent, thus reducing errors to a minimum. The pulp of each sample is retained for future reference, subject to order of sender.

Money in payment of fees sent by registered letter, Post Office Order, Postal Note, Express Order, etc., must invariably accompany samples in order to insure prompt return of certificates, which are not sent till fees are paid in full.

Price List for Assays

Gold and silver ores.	For 1 Sample.	For 3 to 5 samples at one time each.	For 6 or more samples at one time each.
Gold, by fire method	$1 00	$0 90	$0 75
Silver, by fire method	1 00	0 90	0 75
Gold and silver	1 25	1 00	0 90
Gold by amalgamation assay for free gold	2 00	1 80	1 50

For amalgamation assay of a gold ore at least 5 lbs. of ore must be sent.

The following tests are recommended along with amalgamation assay: Fire assay of the ore to see how results obtained check off with the amalgamation assay: panning down of ore to obtain concentrates: and fire assay of the concentrates, also fire assay of tailings.

The laboratory is also prepared to do cyanide assays on raw ore, tailings, concentrates, etc., with amalgamation tests and fire assays where needed. Not more than 50 lbs. of ore can be treated.

The Laboratory makes a specialty of Check Assay Work on gold ores. Samples sent in for check assays must be crushed to at least 5 or 10 mesh, especially in the case of gold ores variable in richness. At least 12 ounces of pulp must be sent for assay. A sample consisting of a single piece of ore, however large, is practically of little value in testing a deposit, and in no case suitable for check assay. Two pieces of gold ore taken from the same spot in a deposit will not necessarily give the same values on assay. The amalgamation assay for gold with fire assay of concentrates and tailings is recommended for gold ores, either in the rough or pulped, containing coarse free gold, as the fire assay alone will give variable results.

The most satisfactory method of checking results is to mix ore pulp and divide the pulp into two equal parts, sending the separate lots to this Laboratory with different marks.

	1 sample.	3 to 5 samples.	6 or more samples.
Miscellaneous assays:—			
Copper by fire assay method	$1 25	$1 00	$0 90
Copper by cyanide method	1 25	1 00	90
Copper by electrolytic method	1 25	1 00	90
Lead by titration method	1 25	1 00	90

	1 sample.	3 to 5 samples.	6 or more samples.
Zinc by titration method	2 00	1 80	1 50
Nickel by electrolytic method	3 00	2 70	2 25
Platinum by fire assay method	2 00	1 80	1 50
Cobalt by electrolytic method	3 00	2 70	2 25
Arsenic by titration method	2 00	1 80	1 50
Manganese by titration method	3 00	2 70	2 25
Chromium by titration method	3 00	2 70	2 25
Antimony by titration method	2 00	1 80	1 50
Bismuth by titration method	2 00	1 80	1 50
Iron (metallic) by titration method	50	45	30
Molybdenum by titration method	2 00	1 80	1 50
Tin fire assay by titration method	2 00	1 80	1 55

A reduction of 15 per cent. on the total is allowed on 6 or more assays on one sample and 20 per cent. on 10 or more assays on one sample.

Fees for Qualitative Examination. Not equivalent to an assay or analytical determination, only showing the presence or absence of certain constituents, no values or percentages given.

Iron	$0 25	Platinum	$1 00
Copper	25	Arsenic	50
Nickel	1 00	Bismuth	50
Cobalt	1 00	Molybdenum	50
Zinc	50	Lime	50
Lead	50	Magnesia	50
Chromium	1 00	Alumina	50
Manganese	1 00		

Complete qualitative examination of any sample, $8.00; other constituents at same rates.

Identification of mineral samples, that is, determination of the constituents that may be determined by inspection, field tests, blow pipe or rough qualitative examination, is done by the Laboratory at a nominal charge of 50 cents per sample; three or more samples at one time 40 cents each.

This also includes a report as to the probable commercial value of the sample.

Samples for identification must be sent in a rough state, *i.e.*, not pulverized. Samples for identification will be reported on free of charge if brought to the laboratory by parties desiring such reports.

Price List for Analytical Determinations

Iron Ores.	For 1 Sample.	For 3 to 5 samples at one time each.	For 6 or more samples at one time each.
Silica	$1 00	$0 90	$0 75
Alumina	1 00	90	75
Ferric oxide	1 00	90	75
Ferrous oxide	1 00	90	75
Lime	1 50	1 35	1 10
Magnesia	1 50	1 35	1 10
Sulphur	1 50	1 35	1 35
Phosphorus	2 00	1 80	1 50
Titanium	2 00	1 80	1 50
Manganese	1 50	1 35	1 10
Metallic iron	50	45	35
Moisture	25	20	15

Other determinations same as in iron and steel.

15 per cent. discount from total for 6 or more different determinations on one sample; 20 per cent. discount for 10 or more on one sample.

Pig iron, steel, cast iron, wrought iron, etc.:—			
Silicon	$1 00	$0 90	$0 75
Sulphur	1 50	1 35	1 10
Phosphorus	2 00	1 80	1 50
Arsenic	2 00	1 80	1 50

Manganese	1 50	1 35	1 10
Graphitic carbon	1 50	1 35	1 10
Combined carbon	1 50	1 35	1 10
Carbon by combustion	1 50	1 35	1 10
Carbon by color	1 00	90	75
Nickel	3 00	2 70	2 20
Cobalt	3 00	2 70	2 20
Chromium	3 00	2 70	2 20
Tungsten	3 00	2 70	2 20
Titanium	2 00	1 80	1 50
Vanadium	6 00	5 40	4 40
Copper	1 25	1 00	90

15 per cent. discount from total for 6 or more different determinations on one sample 20 per cent. discount for 10 or more determinations on one sample.

Limestones, clays, marls, cements, etc., etc.:—

	For 1 Sample.	For 3 to 5 samples at one time each.	For 6 or more samples at one time each.
Silica—free	$1 00	$0 90	$0 75
Silica—combined as in clay	1 00	90	75
Ferric oxide	1 00	90	75
Ferrous oxide	1 00	90	75
Alumina—combined	1 00	90	75
Alumina—free as corundum or bauxite	1 00	90	75
Lime	1 50	1 35	1 10
Magnesia	1 50	1 25	1 10
Alkalis—soda and potash	1 50	1 25	1 10
Carbonic acid	1 00	90	75
Organic matter	1 00	90	75
Sulphuric acid	1 50	1 35	1 10
Moisture	25	20	15

NOTE:—Complete analysis of a sample is always preferable, as it includes a report on the quality and commercial value of the sample, also the industrial uses to which the material may be put. Reductions on several determinations on one sample as in iron ores.

Coals, cokes, peat, lignite, etc.:—

Moisture	$0 25	$0 20	$0 15
Volatile combustibles	1 00	90	75
Fixed carbon	1 00	90	75
Ash	1 00	90	75
Sulphur	1 50	1 35	1 10
Phosphorus	2 00	1 80	1 50
Analyses of ash, same rates as in rocks, Calorimeter tests of heating value (British Thermal units)	6 00	5 40	4 50

Ultimate analyses:—
Carbon, Hydrogen, Nitrogen, Oxygen, Ash, etc., special rates on application.

MINING ACCIDENTS

BY E. T. CORKILL, Chief Inspector of Mines

During the year 1910 at the mines regulated by the Mining Act of Ontario there were 46 fatal accidents, causing the death of 48 men, being a decrease of one as compared with the previous year. Of the fatalities 29 occurred below ground and 19 above ground. The total number of serious accidents in the mines of Ontario reported to the Bureau of Mines was 107, resulting in 48 men killed and 67 injured. Of these accidents 69 occurred below ground and 38 above ground. The fatal accidents took place at mines operated by 34 different companies.

Analysis of Fatalities

The 46 fatal accidents took place in the following months:—

January, 3; February, 2; March, 1; April, 2; May, 5; June, 5; July, 1; August, 6; September, 6; October, 4; November, 6; December, 5; total 46.

An investigation and report were made in 41 of the 46 fatal accidents that occurred during the year. In addition, the more serious non-fatal accidents were investigated and reported on.

The following table shows the number of men and their nationality killed at the different classes of work:

Occupation.	English speaking.	Italian.	Finlander.	French.	Polander.	Austrian.	Swedish.	Russian.	German.	Norwegian.	Indian.	Total.
Surface laborer	1	5	.....	.....	2	.....	.....	.....	1	.....	.....	9
Machine helper	4	.....	2	1	.....	1	.....	.....	.....	.....	.....	8
Machine driller	3	.....	3	1	.....	.....	.....	.....	.....	.....	.....	7
Mucker	3	.....	.....	1	.....	1	.....	1	.....	.....	1	7
Hand Miner	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	2
Foreman	1	1	.....	.....	1	.....	.....	.....	.....	.....	.....	3
Manager	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Scaler	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Trackman	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Pumpman	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Block holer	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Electrician	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Student	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Ore sorter	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Top-hoistman (blast furnaces)	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Brakeman	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Painter	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Repair man	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Total	21	7	5	4	4	2	1	1	1	1	1	48

Of the 48 fatalities in 1910, 14.6 per cent. resulted from falls of ground; 16.6 per cent. from shaft accidents; 20.8 per cent. from explosives; 8.4 per cent. from miscellaneous causes underground and 39.6 per cent. from accidents on the surface.

Cause and Place of Fatalities

The following schedule shows the cause and place of the fatalities in 1910 compared with 1909:

	1910.	1909.
Below ground:		
Falls of ground	7	5
Shaft accidents:—		
Falling from bucket	1	
Falling down shaft	2	
Cage accidents	2	
Riding on skip contrary to law	1	
Objects falling down shaft	2	
	— 8	10

Accidents from explosives:—			
Premature explosion while loading or lighting holes....	4		
Picking or putting bar into old hole containing explosive.	2		
Drilling into bottom of old hole	2		
Picking into explosive in muck	2		
	—	10	17
Miscellaneous accidents:—			
Falling down winzes	3		
Struck by rail used in replacing car.....	1		
	—	4	4
Above ground:			
Surface fatalities:—			
Slip of ore in blast furnace	2		
Smelter, miscellaneous	5		
Asphyxiated by gases at top of blast furnace	1		
Fall from trestle or framework	2		
Thrown from car	1		
Electrocuted	3		
Struck by cage while looking down shaft.....	1		
Run over by railway car	1		
Cave-in of trench	1		
Struck by falling shear-leg.....	1		
Fall from ladder	1		
	—	19	13
		—	—
Total		48	49

Classifying the accidents according to degree of responsibility attached to the contributing causes, the following distribution is obtained:—

1. Accidents due to danger inherent to the work itself	10 or 21.7	per cent.
2. Accidents arising out of defect in mine workings	10 or 21.7	do.
3. Accidents through fault of fellow workmen	4 or 8.7	do.
4. Accidents through fault of injured person	21 or 45.7	do.
5. Accidents impossible to classify	1 or 2.2	do

The following table summarizes the fatalities in the mines of Ontario from 1900 to 1910 inclusive, with reference to the number of persons employed:—

Table showing Fatal Accidents in Mines of Ontario, 1900 to 1910

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	Total.
Persons killed in producing and non-producing mines	17	13	10	7	7	9	11	22	47	49	48	240
Persons employed in producing mines..	3,330	4,135	4,426	3,499	3,475	4,415	5,017	6,305	7,435	8,505	10,862	61,304
Persons employed in non-producing mines (estimated).....	650	550	450	400	400	500	750	1,140	1,750	2,000	2,000	10,590
Total persons employed	3,980	4,685	4,876	3,899	3,875	4,915	5,767	7,345	9,185	10,505	12,862	71,894
Fatal accidents per 1,000 employed	4.27	2.77	2.05	1.79	1.80	1.83	1.90	2.99	5.11	4.66	3 73	3.33

Cause and Place of Non-Fatal Accidents

The following schedule shows the cause and place of the non-fatal accidents in 1910, and the number injured:—

Underground:		
Falls of ground		5
Shaft Accidents:—		
Riding in bucket contrary to Act	1	
Cage accidents	6	
Objects falling down shaft	1	
Falling down shaft	2	
	—	10
Explosives:—		
Premature explosion	5	
Picking or putting bar into old hole	2	
Drilling into bottom of old hole	1	
Picking into explosives in muck	2	
	—	10
Miscellaneous accidents:—		
Falling down stopes, raises, winzes or man-ways	6	
Jammed by cars or bucket	8	
Scaling	1	
Miscellaneous	7	
	—	22
Surface:—		
Caught by machinery	7	
Explosives	1	
Falling material	4	
Jammed by cars	3	
Miscellaneous	5	
	—	20
Total		67

Mining Regulations and How Observed

The regulations regarding the operation of mines in the Province were fairly well observed during the year. The more important regulations, regarding the timbering of shafts, stopes, etc., are better observed than the so-called less important rules, such as those requiring protection of shaft openings and machinery by guard rails. Mining companies in the initial stage of development work on their properties are often more negligent than after the mines have begun production. The matters in which negligence is most often shown are as follows:—

1. The erection and maintenance of approved thawing houses.
2. Guards for shaft openings.
3. Guards for dangerous machinery.
4. Leaving loose powder in underground workings.
5. Maintaining auxiliary ladders in the shaft while sinking.
6. Reporting of careless practices by the workmen.
7. Drilling and picking into old bottoms of holes that have been blasted.
8. Guarding and proper insulation of electric wires and apparatus.

Carelessness in regard to the above has resulted in many serious and fatal accidents. One of the first essentials in starting to develop a mine is to provide a suitable magazine and approved thawing house. The failure to do so generally results in the

deterioration of the explosive, and creates the dangers involved in thawing and handling improperly prepared material. A number of the other rules violated are referred to in another part of the report in connection with accidents that have resulted from such violation.

The following notes describe briefly the fatal accidents from the several causes, and methods that should be adopted for their prevention.

Falls of Ground

There were 7 fatal accidents from this cause, resulting in the death of 7 men. This was an increase of 2 over 1909. Of these 7 fatalities, 2 resulted while the men were actually engaged in scaling and were struck by the rock they had loosened. These accidents were evidently the result of carelessness or incompetence on the part of the men killed. If caused by incompetence, then the company were at fault for putting unskilled men at the important work of scaling, where only skilled miners should be employed. Three men were killed by being struck by rock falling from the wall or roof of the stope at which they were working. The onus for these accidents must be placed on the companies. The Mining Act requires the roofs and walls of all working places to be inspected and scaled once every week, and a record kept thereof. It is, however, necessary that the walls, in proximity to ground that is blasted, should be inspected and scaled after every blast. It is essential that some of the bosses should look over this ground and see that the machine men or scalers have left it in a safe condition. Miners are naturally careless and take too much for granted about the condition of the walls and roof. In our copper-nickel, iron and other low-grade ore mines the stopes are large, and it is good practice, and one that is adopted by a number of the companies, to have men whose sole duty is to scale, constantly going over the walls and roofs to see that they are safe.

One man was killed by a piece of rock in which he was drilling in the roof of a drift, falling on him. Such accidents are rare, since the danger can be at once detected by the sound of the drill working on the rock. It is to be feared that incompetency is a heavy factor in causing our large fatality list.

Shaft Accidents

There was a further reduction of fatalities from shaft accidents, there being 8 men killed in 1910 compared with 10 killed in 1909. One marked improvement was in cage accidents, there being but 2 men killed from this cause in 1910, compared with 5 in 1909. One of these men was killed by attempting to ring the bell while the cage was in motion. The other man was apparently seized by a fainting or dizzy spell while riding alone on the cage, and falling to the floor was caught in the timber. The only prevention for accidents of this nature is to have cages that are used for hoisting or lowering men completely cased in. The following is a description of cage recommended by the committee appointed by the American Mining Congress to draft a uniform mining law for prevention of mine accidents:

The hood shall be of two steel plates 3-16 inch in thickness, sloping toward each side, and so arranged that they may be readily pushed upward to afford egress to persons therein; and such bonnet must cover the top of the cage in such a manner as to protect those on the cage from objects falling in the shaft. The cage shall be provided with sheet-iron or steel side casing, not less than 1-8 inch thick, or with a netting composed of wire not less than 1-8 inch in diameter, and with doors made of the same material as the side casing, either hung on hinges or working in slides. These doors shall extend at least 4 feet above the bottom of the cage and must be closed when lowering or hoisting men, except timbermen riding on the cage to attend to timbers that are being lowered or hoisted. Every cage must have overhead bars of such arrangement as to give every man on the cage an easy and secure handhold.

This type of cage would eliminate accidents such as occurred this year. It would be advisable for mine managers installing new cages to have them built according to the above specifications.

Two men were killed through falling down the shaft while working part way down. In one case the man was repairing timber and standing on a ladder fastened by a rope to the top rung, when the rung broke, allowing him to fall to the bottom. In the other case a pump-man was repairing the pump on the landing at a level, when he stepped backwards into the unguarded shaft opening. The company in the latter case was prosecuted by the Inspector of Mines before the Police Magistrate of Cobalt, for violation of the law in not having guard rails, and was fined $100 and costs.

Two men were killed by being struck by objects falling down the shaft, caused by using defective gearing. One was struck by a bucket falling, owing to the breaking of an eye-bolt in the horse-whim, and another was struck by a falling machine which was being hoisted in a rope sling, due to the breaking of the rope. This emphasizes the necessity of a daily inspection by a competent official of all gearing, as required by the Mining Act.

One man was killed by falling from a bucket while being hoisted away from a blast, and another through riding up on a skip. The former slipped while getting on the bucket and held on with his hands, his partner not having presence of mind enough to stop the bucket at once and help him in. Many miners apparently get nervous when lighting fuse in a shaft. The manager should never allow men of this class to light fuse in a shaft or winze, as accidents are sure to happen sooner or later. The other man was stealing a ride on the skip, and apparently attempted to get out before the surface landing was reached, so that he would not be caught by the boss, and was run down by the skip. It is absolutely necessary for superintendents or shift bosses to report to the Inspector of Mines whenever they find a man riding on the bucket or skip contrary to law, so that the man can be prosecuted. If a man knows he will be fined from $10 to $100, if caught, he will hesitate before taking the chance. I consider this the most effective way of stopping this practice, and would ask that all cases be reported.

Safety Crossheads

It has been shown in former Reports of the Bureau of Mines that a number of accidents are caused through the falling of crossheads in shafts. To overcome this difficulty, two crossheads have been patented by Messrs. Morin and Sargeson, master mechanics at the Nipissing and Waldman mines. The idea of these patents is to keep the crosshead from falling when it sticks in the shaft. In the Sargeson patent, which is shown in the accompanying cut, the attachment A is fastened to the crosshead at C. If the crosshead sticks, this arm automatically engages the clip B attached to the cable, and so stops the bucket. In sinking operations the arm A is automatically tripped by the stopblock E, allowing the bucket to descend to the bottom of the shaft.

The same principle is adopted in the Morin crosshead in the bucket follower, shown in the accompanying cut. It is further equipped with an automatic safety device, which by the aid of springs enables dogs to grip the guides, thus making it impossible for the crosshead to fall.

Accidents from Explosives

Ten men lost their lives through explosive accidents underground in 1910, and none on the surface. This is a marked improvement over 1909, when 49 per cent. of the total fatalities were caused by explosions or gases from explosions, compared with 20.8 per cent. in 1910. Four of these fatalities were the result of contravention of the Mining Act by the employees who were killed, in picking or drilling into old bottoms of holes that had been blasted. An employee of the City of Cobalt mine was prosecuted in July, 1910, before the Police Magistrate at Cobalt for a violation of section 164, rule 9, of the Mining Act of Ontario, and fined $10 and costs.

There were two accidents, involving the death of 4 men, from premature explosions while loading or lighting holes. The men present were killed in both accidents, consequently it was impossible to ascertain the exact cause of the explosions. Two men were killed as a result of picking into gelignite in the muck.

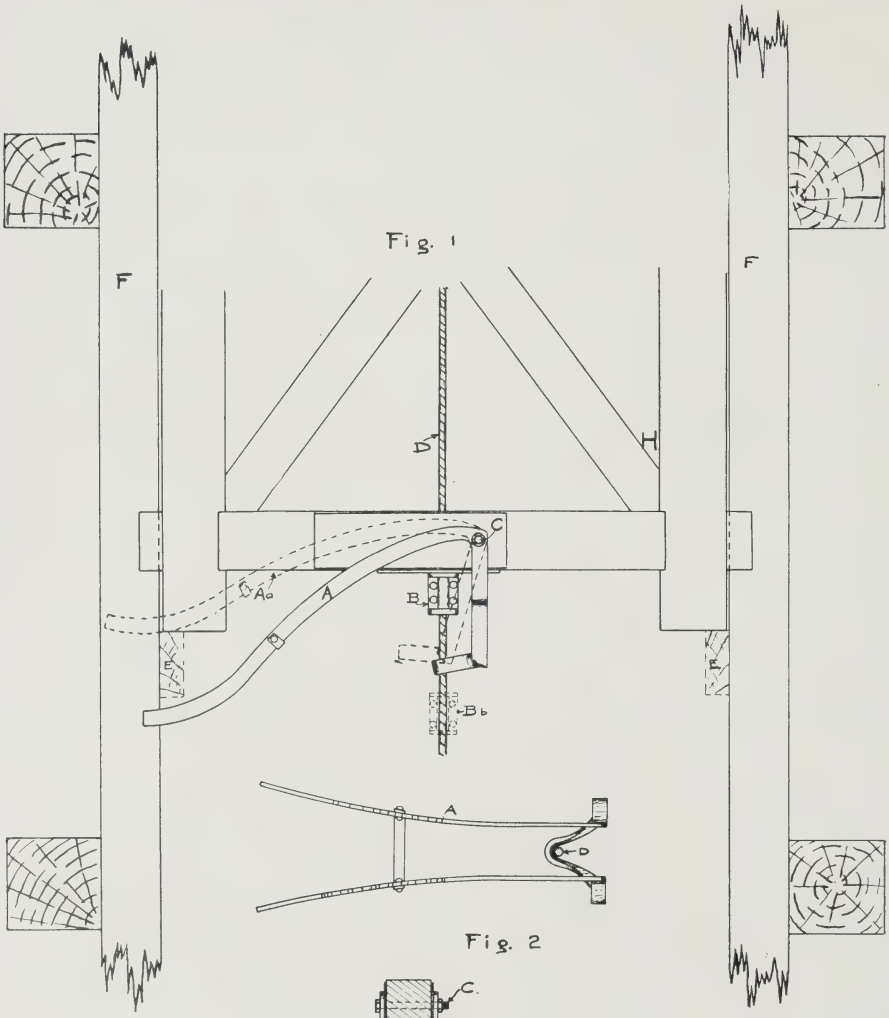


Fig. 1

Fig. 2

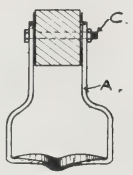
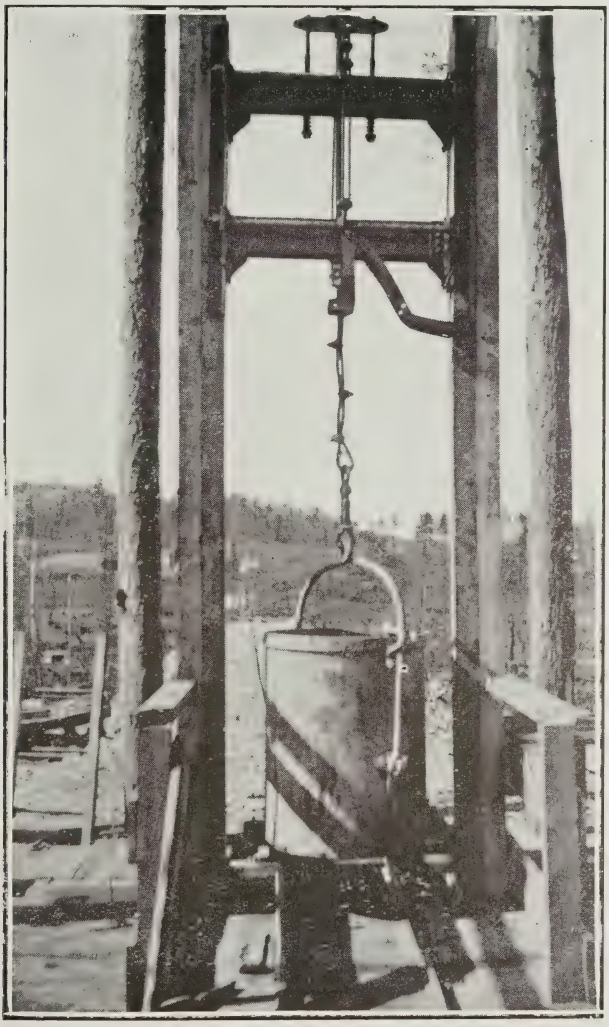


Fig. 3

A. Attachment in normal position.
Aa. Attachment tripped by crosshead stop.
B. Clip in normal position.
Bb. Clip lowered through tripped attachment.
C. Draw pin.
D. Cable.
E. Crosshead stops.
F. Guides.
H. Crosshead.

Sargeson's safety crosshead and attachment. Patented June 14th, 1910.

No lives were lost through asphyxiation from explosive gases. A number of men, however, were overcome with gas in mine workings during the year, but fortunately were easily resuscitated. With the increased development in the mines, natural ventilation of the underground workings will be bettered. The adoption of artificial ventilation, other than that due to air from the machine drills, in mine workings that have not,



Morin safety crosshead and bucket follower.

through force of circumstances, been able to secure sufficient outlets, is recommended. The installation of fans would, besides adding to the comfort and health of the miners, be an economic advantage to the company. Loss of time, through miners waiting for the smoke and gases to clear, is considerable, and if the workings were continually supplied with good air by fans the cost of installation and operation would soon be made up by the time saved.

Miscellaneous Accidents

Three men were killed as a result of falling down winzes. These are, as a rule, not properly protected. A winze is as dangerous as a shaft, and should be protected accordingly. The same conditions apply to sinking winzes and working from them as to shafts.

Surface Accidents

There were 19 men killed in surface accidents at the mines of Ontario in 1910, compared with 13 in 1909. Most of these accidents were from causes simple and easily preventible if a little care had been taken or intelligence shown. Work on the surface around mines, smelters, blast furnaces and concentrating mills should not be as hazardous as underground work. Still, in 1910 the fatality rate for Ontario was practically as great on surface as underground in proportion to the number of men employed.

Accidents at smelters, refineries and blast furnaces were responsible for 8 deaths. The labor employed at such plants is of the lowest type of intelligence of all our foreign labor. The men are generally unable to speak English, and seem to be slow in adapting themselves to their work and surroundings. They appear to lack initiative, and are as helpless as children in protecting themselves from injury. Out of the 8 deaths at smelters and blast furnaces, 5 were of foreigners. It is necessary for superintendents to put this ignorant class of labor at work where there is no hazard.

Three men were killed by being electrocuted. This is a new type of accident, and one that will need considerable attention in future. At present about 20,000 horsepower of electric energy is being used by the mines and works. This amount will be increased as the industry expands. The National Board of Fire Underwriters (U. S.) have formulated very strict rules respecting the installation of live wires and electrical machinery. The protection of human life is a matter of greater importance than the protection of property. Where the power is used below ground, the dampness, darkness and limited space make the hazard all the greater, and the necessity for careful and systematic inspection the stronger. Ignorance of electric power and its dangers necessitates greater protection, and the employment only of competent electricians to look after the electrical apparatus.

An Act to Regulate the Use of Electricity in Mines in Ontario was passed by the Legislative Assembly in 1911 as an amendment to the Mining Act of Ontario. It regulates the pressure at which the power is allowed to be used underground, and provides for the efficient insulating and grounding of all transmission lines and electric apparatus. It also provides for the enclosing of all live parts of switches, fuses and cut-outs, and for regulating the work when the current is on. Provision is made for the firing of shots by power cables, the use of electricity in thawing explosives and for electric drilling machines. The penalties for infringements of these provisions are the same as provided for offences against Part IX. of the Mining Act.

One workman was killed by being hit by a descending cage while leaning over the guard rail in the shaft house. This workman was perfectly familiar with the operation of the cage, but apparently for the moment lost sight of his surroundings. It might be a further safeguard to have gates at the surface landing sufficiently high to render it impossible to lean over them.

Four other men were killed by miscellaneous accidents.

Health of Miners

The mining camps of Ontario in 1910 were fairly free from disease of any kind, and compared favorably as to general condition of health with the rest of the Province. The typhoid epidemic of 1909, through a number of the camps, had taught the companies a valuable lesson, and greater attention was paid to the sanitary conditions and the supplying of pure drinking water.

Mine Hospitals

The mine hospital at Cobalt, owned by the Cobalt Mines Hospital, Limited, and conducted for the benefit of the miners by representatives of the mining companies of the Cobalt camp, has proved to be invaluable. All the sick or injured employees of the mines are well cared for. The employees subscribe 50 cents per man per month to the hospital, and any deficit is taken care of by the companies. The president of the hospital board, Mr. Tom R. Jones, superintendent of the Buffalo Mines, and the members of the board, have proved indefatigable in their work of making the hospital efficient.

The report of the president for the year March 1st, 1910, to February 28th, 1911, shows that 216 medical and 182 surgical cases were treated for the year. In the previous year 651 medical and 251 surgical cases were treated, which shows a general improvement for 1910 over 1909.

There were 54 cases of typhoid, of which 38 cases were from the town of Cobalt, cared for during the year.

The report shows that there were 9 deaths in the hospital from accident cases, and a recovery of 95.1 per cent. of the accident cases treated.

All the mines in the Cobalt camp are subscribers to the hospital, with the exception of the McKinley-Darragh, Ophir and King Edward.

The Canadian Copper Company's hospital at Copper Cliff is also one of the finest hospitals in northern Ontario. It was built and equipped by the company for their own employees; the latter contribute the regular rate per month for free medical attendance and hospital accommodation.

The success that has attended these two hospitals in their care of the miners should encourage other companies to follow their lead.

The Need of Technical Education for Miners

The time has come when directors of mining companies are realizing the necessity of appointing technically trained men in charge of mines. It is to be feared, however, that this move has been brought about by the desire to lessen the cost of mining, and by so doing reap greater rewards in increased dividends, rather than from a desire to lessen mine accidents. The appointment of thoroughly trained technical men will accomplish these results, through so organizing the work that a greater efficiency from all the workmen will be obtained. This increased efficiency means a more intelligent class of workmen and a lower accident rate. In annual reports of mining companies we see in the statement of expenditure a considerable item either under the head of accidents or insurance. This item of insurance generally includes payments to Employers' Liability Insurance companies. A mining company pays a certain percentage of its pay-roll to a Liability Insurance company, which agrees for this consideration to assume the responsibility for damage in the case of accident to employees. It is too often the case that companies insured in this way pay little attention to the claim of the employee for damages, alleging that this is the work of the Liability Insurance company. If operators would stop to consider this phase of the case, they would see that they are practising false economy. The lower the accident rate, the lower the liability rate of insurance. Accidents are classed in this report under five headings, namely: (1) accidents due to danger inherent to the work; (2) accidents arising out of defects in the mine workings; (3) accidents through fault of a fellow workman; (4) accidents through fault of injured person; (5) accidents impossible to classify.

Under the first heading, though the accidents are classified as being inherent to the danger of the work, they are not necessarily unpreventible. Here is a field for the scientifically trained man to work out ways and means for minimizing the number of such accidents. The old class of miners have always looked on such accidents as unpreventible, thinking they must happen as long as mining continues. This is a mistaken way of looking at the matter. The governments of different countries have appointed corps of technically trained men to work on this subject with the object of

lessening the hazards to which miners are exposed. This applies particularly to coal mining. It is no less applicable, however, to metal mining, as statistics in this continent show that the accident rate in metal mining per thousand men employed is as high, if not higher, than in coal mining.

Accidents due to defects in the mine workings are preventible, and it is almost criminal for the manager and superintendent of a mine to have accidents of this nature. Managers are often retarded in the work of putting their mine workings in proper condition by owners or operators objecting to the additional cost. This is false economy, and, if wilful, places them amongst the worst type of criminals. It is more charitable, however, to take the position that they are ignorant of the dangers, and need to be educated. It is sometimes the case that managers issue instructions regarding the work to their superintendents and foremen. These men are practical miners who have worked up from being laborers to their present positions. They have become accustomed to certain dangerous practices, and though they have been ordered by the manager to report any defect or violation of rules, they omit to do so until the accident occurs. These omissions by the superintendent or foreman are not intentional or with a view of causing accidents; they are the result of not being able to grasp the exact meaning of their orders or to realize the danger of the practices they permit. In other words, they lack the mental training that persons in such responsible positions should have.

Reckless Workmen Endanger their Fellows

The accidents that are the most difficult to prevent are those due to the neglect of the injured person or his fellow workmen. No matter how safe the mine workings are, or how efficient and strict are the laws and their enforcement, the reckless and foolhardy employee can not only endanger his own life, but also the lives of his fellow workmen. Just so long as miners will carelessly handle explosives, or drill into old bottoms of holes, or neglect to tamp holes, or attempt to drill near missed holes containing powder, there will be fatal accidents from these causes. Such dangerous practices also jeopardize the lives of the other workmen. In the same class are the workmen who will work under loose rock or steal rides in buckets or skips. These men are not as a rule ignorant of the dangers, but in a sort of bravado take the chance. There is something wrong with a man's mental training when he does such things. He lacks that quality of training that will restrain him from doing things that are foolhardy.

The amount of earning power that is lost yearly to the industry at large through mining accidents is sufficient to make all those who are seriously interested in the industry think carefully of ways to prevent it. In 1910 there were 48 men killed in the mines of Ontario. Assuming that each of these workmen had still an earning power of $5,000, we find that $240,000 was lost to the country. In addition to this was the time lost by men injured in mines and thus unable to work for periods longer or shorter. Also some men were so crippled in accidents that they will never again have the same earning capacity. We thus see that upwards of $300,000 of earning power was destroyed in the mining industry in Ontario in 1910.

What means can be adopted to save this amount, and by so doing save suffering and distress to hundreds of people? If, as the writer has endeavored to prove, a large number of the accidents are the result of lack of mental training both in the workmen themselves and up through the scale to the owner or operator, it is high time that some combined effort should be made to remedy this defect. In this age of agitation for technical training, the mining industry, in so far as the workmen themselves are concerned, has been neglected. Metal miners are a cosmopolitan class, necessarily so by the uncertain length of life of the mines. It is, therefore more difficult to establish training schools where the families of these miners would have the advantage of at least a good primary education. If the mining companies would interest themselves in this phase of the case, much could be accomplished. We see in the cities technical schools where the young mechanic can secure a training along lines that assist him in

his work. Why should this not be applicable also to the mines? In Ontario there are a large number of young men just entering the field of mining. It would seem that this field for training should not be neglected.

The fatal accidents that occurred during the year are described fully below, after which is given a table of fatal and non-fatal accidents.

Algoma Steel Company

At No. 2 blast furnace of the Algoma Steel Company, on April 24th, Giovanni Buzzato, laborer, had his clothing ignited by the hot gases expelled, due to a slip in the furnace, and was burned so seriously that he died a few hours later.

The deceased was employed in unloading a car of limestone on the trestle over the ore pockets about 150 feet from the furnace. The latter had been working badly, and the men in charge were trying to let it down when the slip occurred. This caused considerable hot coke and limestone to be expelled through the explosion doors at the top of the furnace. Some of the hot coke struck Buzzatto and set his clothing on fire, burning him severely before assistance reached him.

The coroner's jury brought in the following verdict: "That Giovanni Buzzato came to his death through burns caused by what is termed a 'slip' at the No. 2 furnace of the Algoma Steel Company, which occurred on the morning of April 24th, 1910, said explosion being due to natural causes, and the jury do not consider anyone to blame. Having regard, however, to the number of accidents which have occurred and are liable to occur from similar causes, the jury is of opinion that some better means of protection should be provided for the employees from accidents of this nature."

At No. 2 blast furnace on June 12th, Danied McLeod, top hoist-man, was severely burnt by hot gases expelled from the furnace by a slip, causing his death on June 15th.

The top-hoisthouse is located about 50 feet from the top of the furnace and on a level with it. The duty of the hoistman is to hoist the charges of ore, fuel and flux, and watch that the furnace is taking the charge properly. For this he has a test rod 20 feet in length operated from the hoisthouse, and is supposed to lower the rod into the furnace about every five minutes to see that the charge is sinking properly. If the charge hangs up in the furnace for more than 15 minutes without moving, the hoistmen are instructed to notify the blower. The furnace had been working well on the night shift of June 11th and up to 10 o'clock on the morning of June 12th, McLeod did not report any hanging up. About 5 minutes after the last charge had been put in, there was a slip in the furnace which caused hot gases to be expelled from the explosion door. These gases were blown by the wind against the top-hoisthouse in which Daniel McLeod was working, setting fire to the window frames and the floor, and burning McLeod very seriously.

The coroner's jury brought in the following verdict: "That Daniel McLeod came to his death as a result of burns caused by an accidental explosion of gas at the No. 2 furnace about 10 a.m., June 12th."

Atikokan Iron Mine

At the Atikokan mine on September 16th, Aleck Oja, machineman, was killed by being struck on the head by a falling rock.

The accident occurred in the east stope about 10 feet below the surface. Oja and his helper had blasted a number of holes in this stope, and after finishing blasting had been ordered by the foreman to scale. They were standing on a bench about 10 feet from the surface when Oja started to scale down the side of the stope, using a scaling bar about 10 feet in length. He had been working only a few minutes when he loosened a large piece of rock which fell on him, striking him and carrying him down the stope a distance of about 40 feet. When picked up, it was found that his skull was fractured.

The coroner, Dr. Laurie of Port Arthur, was notified, but not being aware of the requirements of the Mining Act did not hold an inquest, and the deceased was buried before instructions could be given from the Department. An investigation into the accident was made by the Chief Inspector of Mines and the evidence of the men taken under oath.

Beaver Silver Mine

At the Beaver mine, on November 4th, Mytro Poirer, mucker, was killed through falling down a winze.

The winze is sunk from the 200-foot to the 300-foot level, with a station at the 250-foot level. A small cage is used for hoisting in the winze. Poirer was mucking on the 250-foot level, and about 5 o'clock went out to the winze and asked his partner to ring down the cage. This was done, but the cage not coming at once, his partner went back into the drift, leaving Poirer standing in front of the winze with his hand on the raised guard-rail. It is thought that when the cage came down, Poirer attempted to board it without ringing it to the level, and in this way fell into the winze.

The coroner's jury brought in the following verdict: "That Mytro Poirer came to his death at the Beaver mine, on November 4th, as the result of an accident from falling down the shaft; and that the Beaver Mining Company should be censured for their negligence in not keeping the shaft protected with a guard-rail."

Bishop Silver Mine

At the Bishop mine, on February 8th, Olaf Moseid, miner, was killed by an explosion of gelignite, caused by cleaning out a hole that had been blasted.

The previous day a round of holes had been fired in the shaft, which was 57 feet deep, and the broken material hoisted. When this shift came off work they reported to the other shift that there was one missed hole in the bottom of the shaft. The new shift after coming on work found the missed hole, but did not blast it until 11.30, when Olaf Moseid stated that he was going to burn it out. He put a piece of fuse in the hole, without putting any exploder on it, and lighted it. When he came back to work he proceeded to clean out this hole, using a gun made of iron pipe. In the course of this procedure the explosion occurred.

The coroner's jury brought in the following verdict: "That Olaf Moseid met his death at the Bishop mine, on February 8th, by an explosion of gelignite, caused by his own negligence."

Canada Cement Company

At the Lehigh quarry of the Canada Cement Company, on August 19th, Allan Brant, trammer, was killed by being struck by a rail which was being used as a lever to replace a car on the track.

Brant was engaged with several other men in replacing a car which had run off the tracks. To do this they were using a length of quarry rail as a lever. In some way the rail slipped from under the car and swinging around struck Brant, knocking him down and falling on him, with the result that he sustained a compound fracture of the skull.

The coroner's jury brought in the following verdict: "That Allan Brant came to his death accidentally at the quarry of the Canada Cement Company, on August 19th, through the negligence of the Canada Cement Company, in not having proper appliances for replacing cars on the track."

Canadian Copper Company

Creighton Mine

At the Creighton mine, on February 10th, John Irish, scaler, was so severely injured by having his leg and foot crushed under a piece of falling ore, that he died three days later.

Irish was engaged as scaler on the third level of the mine. While barring down a loose piece of rock another piece beside it fell on him, breaking his leg in two

places and crushing it so badly that it had to be amputated just below the knee. It was found two days after the operation that the flesh had started to decay. His leg was consequently amputated again, about 3 inches above the knee, after which operation he died in about an hour. The stope had been scaled the day before. It was the duty of the deceased to see that all the loose rock was scaled down.

The coroner's jury brought in a verdict of accidental death.

At the Creighton mine, on September 8th, Yojo Wanio, drill runner, was killed by being struck by falling rock.

The deceased was drilling on a bench about 50 feet above the floor of the open cut, on the hanging wall side of the stope. Just back of and above him there was a cutting-in stope, about 30 feet wide and 25 feet high. The roof of this stope had been arched and the deceased was working on a bench between this cutting-in stope and another one of the same kind. Just before the large piece of rock fell a number of small pieces dropped, warning the men that it was dangerous. They all sought safety with the exception of Wanio, who got behind and under the drill, which he apparently thought would protect him. When the large piece of ore fell it struck the leg of the tripod of the drill and jammed the deceased under it, crushing him so badly that he died a few days afterwards.

The coroner's jury brought in a verdict of accidental death.

At the Creighton mine, on October 4th, Peter Klorodiski, block-hole driller, was killed through drilling into an unexploded block-hole.

The accident occurred at the fourth level of No. 2 shaft. The deceased had been employed as a block-hole driller for about three weeks, his duty being to drill short holes in all the large pieces of ore that could not be handled, and to blast them. The block-holer on the night shift had fired 10 block-holes at midnight and had drilled 5 others before going off shift. Klorodiski, after coming on shift, drilled one short block-hole and was starting on the second when the explosion occurred. The piece of ore in which he was drilling was several feet in length and was broken by the force of this explosion. It appeared that Klorodiski must have drilled into an old hole that had been loaded but had failed to explode.

The coroner's jury brought in a verdict of accidental death, but blamed Klorodiski for not cleaning off the rock properly before starting to drill.

Creighton Mine Yards

At the Creighton Mine yards of the Manitoulin and North Shore railway, on June 30th, Samuel Eyre, brakeman, was run over by a car.

The deceased was a rear brakeman on an ore train, owned and operated by the Manitoulin and North Shore railway, which takes ore under contract from the Creighton mine to Clara Belle siding. The procedure at the mine after the cars are filled at the rockhouse is to allow them to run by gravity to the swamp, where they are picked up by the locomotive and hauled to the mainline. On the day this accident occurred two cars were standing near No. 1 rockhouse and four other cars were at No. 2 rockhouse in charge of two Italians, whose duty it was to control their speed when going down grade. The four cars were started, and running down grade apparently uncontrolled, struck the two at No. 1 rockhouse. The deceased in some way was under the two cars, whether having fallen from the top of the cars, or having been engaged in making a hose coupling, is not clear. He was dragged about ten car lengths and died a few minutes after. The Italians in charge of the four cars asserted they were unable to control their speed.

The coroner's jury brought in the following verdict: "That Samuel Eyre came to his death by being run over by a car which was struck by four loaded cars, and that the present system of running cars of ore from No. 2 rockhouse to what is known as the swamp is unsafe and should be remedied."

No. 2 Mine

At No. 2 mine, on December 22nd, John Kauppi, drill helper, was killed by being run over by the skip while he was attempting to leave it near the surface when it was in motion.

After stopping work on December 22nd, Kauppi and four others started to walk from the sixth level to the surface. When they reached the fifth level Kauppi proposed that they ride up on the skip. The others refused, but Kauppi stated he was going to ride up anyway. When the other men were at the third level the skip passed them with Kauppi in it. Not appearing at the dry-house some minutes later, search was made, and his body was found on the skip road 60 or 70 feet from the surface landing. It is supposed that Kauppi, in order to avoid being caught disobeying rules, attempted to leave the skip before it reached the surface, and in so doing was run over by the skip.

The coroner's jury brought in the following verdict: "That John Kauppi came to his death on December 22nd, through injuries while riding on a skip contrary to rules."

Smelter

At the smelter of the Canadian Copper Company, on June 8th, Artymon Kukulnisk was killed by being struck with a bar he was using in taking a shell from a slag pot.

The deceased was employed on the slag dump, it being his duty to help dump the slag pots that are hauled out by the engine. He was at this work on the night of June 8th, when part of the shell struck the bar he was using, forcing it against his abdomen and causing perforation of the small intestine.

The coroner's jury brought in a verdict of accidental death.

On August 26th, D. L. Antonio, converter-man, was killed by being crushed between a ladle and a car.

The deceased was in charge of No. 4 converter, and had been at work about 18 hours. The morning was rather hazy, so that the crane-man, who was in a pulpit about 40 feet above the floor, could not see very distinctly. In lifting the ladle, which weighs about 3 tons, it swung a little, owing to the crane being off centre. Antonio was leaning against the car, apparently dozing, as he made no effort to get out of the way when the crane-man shouted to him. He was crushed between the ladle and the car, dying shortly afterwards.

The coroner's jury brought in the following verdict: "That D. L. Antonio came to his death on August 26th, through an accident due to negligence on his own part."

While engaged in construction work at the new reverberatory furnace, on November 24th, Enrico Bedino was killed by being struck on the head by a falling shear leg.

The deceased was employed as shift boss looking after a gang of Italians who were at rock work, on the excavation for the new reverberatory plant. On the day of the accident the superintendent of construction work had ordered Bedino and his gang to a place some 25 yards distant, to be out of the way of the erection of a mast for the derrick. The mast was about 60 feet long and was erected by means of a rope fastened to the top, passing over a pair of shear legs placed about half-way down the mast, and then to a hoist on the railway some distance away. These shear legs were held in position by a couple of braces until the strain of the cable would come on them. While this was going on Bedino had strolled over from where his gang were, and stood watching the men at work on the erection of the mast. Without any warning one of the braces holding up the shear legs fell, allowing the shear legs to fall. One of them struck Bedino on the head, fracturing his skull, from which injuries he died about seven hours later.

The coroner's jury brought in the following verdict: "That Enrico Bedino came to his death through being struck on the head by a shear leg, and that the said accident was due to his negligence in not being with his gang some 25 yards away."

Canada Iron Corporation

At the blast furnace of the Canada Iron Corporation at Midland, on December 5th, Angus Crossen, repair-man, was asphyxiated by furnace gas while engaged cleaning out the chutes at the top of the furnace.

The furnace where the accident happened was blown in in August, 1910. It is of Roberts design, having a rated capacity of 300 tons of pig-iron per day.

About 11.30 p.m. on December 4th, Crossen asked for Mike Pisardo to go to the top of the furnace with him. The superintendent had previously instructed Crossen never to go to the top of the furnace without taking some man with him, and then not to remain more than 15 minutes. On the night of the accident, Crossen found that the ore was sticking in the chute at the top of the furnace owing to frost. He took a bar and shovel and started to clean it down, and told Pisardo to assist him. They worked at this for about 10 minutes, when Crossen was overcome by gas. He was drawn out on a girder by Pisardo, who then started for assistance, but was also overcome by gas before he got down. The blower of the furnace, becoming alarmed at the length of time the two men were remaining at the top of the furnace, went up to investigate and found Crossen and Pisardo both unconscious. The latter recovered, but Crossen died.

The coroner's jury brought in the following verdict: "That Angus Crossen came to his death on Monday, December 5th, through inhaling gas at the smelting works of the Canada Iron Corporation, Limited, in discharging his duties at the top of the furnace. That the accident was due to disobeying of orders in remaining too long in close proximity to the gases exuding from the furnace, and furthermore in not placing his helper in proper position to give the necessary alarm for assistance. That no blame can be attached to the company, as they have, by instructions and alarms, taken every precaution possible in safeguarding the lives of their workmen."

Casey Silver Mine

At the Casey mine, on May 26th, John Loucks, mucker, was killed through picking into gelignite that had been left either in the bottom of an old hole or in the muck.

The accident occurred on the 220-foot level of the mine, where a round of four holes had been fired on the morning of May 25th. Four reports were heard, and, during that day, most of the rock broken had been mucked out. Loucks was finishing this work, and was taking up the last bucket of rock on the bottom of the drift when the explosion occurred, which injured him so seriously that he died on June 4th.

The coroner's jury brought in a verdict of accidental death.

City of Cobalt Silver Mine

At the City of Cobalt mine, on May 4th, Oliver Martell, machine runner, was killed through an explosion caused by drilling into the bottom of an old hole.

The deceased was employed in driving a cross-cut on the 200-foot level. On May 3rd, Martell and his helper blasted a round of 8 holes in the cross-cut. This was mucked out that night, but no drilling done. On May 4th Martell set up his machine and started drilling in the same heading. He had drilled one new hole, deepened the breast hole about a foot, and started to drill in the bottom of the centre cut-hole when the explosion occurred. It is impossible to say what caused the gelignite to be left in the bottom of this hole when the rest of the hole exploded. Martell, however, was deliberately violating the Mining Act by drilling in this old bottom. The superintendent and the shift bosses proved that they had given instructions a number of times that no drilling should be done in the bottoms of old holes.

The coroner's jury brought in a verdict of accidental death, but recommended that notices printed in the different languages should be posted at the shafts forbidding the practice of drilling into old bottoms.

Cobalt Union Silver Mine

At the Cobalt Union mine on November 16th, Stephen Labelle, mucker, had his skull fractured by being struck on the head by a falling bucket, due to the breaking of the eyebolt in the horse whim.

The shaft where the accident occurred was 100 feet deep and was being sunk by contract by two French-Canadians, in whose employ Labelle was at the time of his death. The shaft was cribbed down with ladder-way and platforms to within about 20 feet of the bottom. Hoisting was being done with a horse whim and derrick, the driving beam being used as a brake by pressing it against the drum. Connection between the driving beam and the drum is made by a movable hook fastened to the beam and fitting into eye-bolts attached to the drum at different places. The eye-bolts were made of 7-8-inch round iron. Labelle and Felix Inivillion were engaged mucking in the bottom of the shaft and were sending up a bucket of muck. When the bucket started Inivillion stepped to the end of the shaft under the protection of the ladder-way, but Labelle stayed directly under the ascending bucket. When the bucket was up 25 or 30 feet the eye-bolt in the drum snapped, leaving it free to allow the bucket to drop to the bottom, where it struck Labelle, killing him instantly.

Coniagas Reduction Company

At the reduction works of the Coniagas Reduction Company, on September 28th, Antonio Tari, laborer, was killed by being crushed under a large radiator coil.

Three Italians were engaged in taking down the framework surrounding a radiator coil. After the framework was removed, the foreman went to another part of the plant to get some tackle for removing the radiator coil, which weighed about 500 pounds. While the foreman was away, the four Italians, with the aid of three others who had been employed in unloading a car of coal outside the building, attempted to move the coil. In doing so it toppled over, falling on Tari and crushing him so badly that he died almost instantly. Tari was one of the Italians employed unloading the car of coal, and had not been put at this work by anyone in authority. They had been asked by one of the Italians working on this coil to help them.

Owing to the coroner at Thorold being unaware of the law requiring inquests to be held on all fatal accidents at mines, he gave orders for the burial of Tari before the Bureau of Mines was notified of the accident. An investigation was afterwards made by the Chief Inspector of Mines, and it was not considered necessary to exhume the body in order to hold an inquest.

Deloro Mining and Reduction Company

At the Deloro Reduction works, on August 8th, Jan Koztouski, laborer, was electrocuted while handling the switch in attempting to start the motor.

The deceased was in charge of the ball mill, which is operated by an electric motor at a pressure of 550 volts. The switch controlling the motor is an ordinary three-pole switch attached to the wall near the motor. During the morning of the 8th instant, it had been necessary to shut off the power and stop the machine twice. This was done the first time by the foreman, and the second time by the oiler, the deceased having no authority to touch the switch. About four o'clock in the afternoon the belt came off the ball mill, and, in the absence of the foreman, Koztouski, it is presumed, went to the switch and shut off the power. In so doing his hand must have come in contact with the exposed metal of the switch, and he received a shock which resulted in his death. The insulated handle had come off this switch, and had not been replaced. The foreman and oiler, in opening and closing the switch, had taken hold of the insulating bar joining the three poles.

The coroner's jury brought in the following verdict: "That Jan Koztouski came to his death on the 8th of August at the Deloro Mining and Reduction Company's works, through coming in contact with an electric switch."

At the same plant, on November 23rd, Samuel Milligan, foreman, was severely burned by a fall of hot flue dust.

The accident occurred in the dust chamber adjoining the cupola furnace. The duty of this chamber is to catch the flue dust, consisting of fine particles of ore and coke, which are carried over from the cupola furnace. On November 23rd instructions were given to have this chamber partially cleaned, as it was thought to be too full to permit the furnace to do good work. The furnace was therefore banked, and the men were set to work to clean out the chamber. This work had been going on for about three hours, and the chamber was partially cleaned out when Milligan came round, took a shovel and stepped inside the chamber. He had been there but a few minutes when there was a fall of flue dust, which filled the entrance to the chamber to a depth of four to six inches. Milligan managed to crawl out of the chamber, when it was found that he was quite badly burnt. For seven days after he was burned he made fairly satisfactory progress, when he suddenly contracted pneumonia, from which disease he died on December 3rd. The doctors stated that the man's vitality was so low, as a result of the injuries he had sustained, that he was easily attacked by pneumonia, and that the burns were primarily the cause of his death.

The coroner's jury brought in the following verdict: "That Samuel Milligan came to his death as a result of burns received at the plant of the Deloro Mining and Reduction Company on November 23rd, the result of an accident, and that we do not consider either the company or the deceased guilty of culpable negligence."

Flinn Property

On lot 33 of the Gillies Limit, owned and operated by A. Rex Flinn, Tony Colleti, laborer, was crushed on July 30th by the caving in of the sides of a trench in which he was working. The trench was about 12 feet deep, the upper three feet being composed of rather loose, sandy soil, and the lower part of gravelly boulder clay, with here and there small pockets of coarse sand or gravel. The cave-in occurred on the up-hill side of the trench, where a wedge-shaped piece about 10 feet long had fallen in from the top. At the place where the cave-in occurred, there appears to have been a larger pocket of sandy material than usual, which would weaken the ground. The night previous to, and the morning of the day of the accident, there had been rain, and it is possible that the seepage had also weakened the ground.

The coroner's jury brought in the following verdict: "That Tony Colleti came to his death accidentally on July 30th, through the caving in of a trench on lot 33. We recommend that a trench over 10 feet in depth should be properly timbered."

Goodwin Lake Mine

At the Goodwin Lake mine, on January 15th, Frank Sheppard, drill helper, sustained injuries which resulted in his death, by falling from a bucket while riding away from a blast, and thus being caught by the blast.

Sheppard and Leo Doyle, machine runner, were engaged on Saturday morning, January 15th, in firing a round of 4 holes in the shaft. The usual blasting signal was given, and the engineer hoisted the bucket a few feet and lowered it again. Doyle then spit the fuse, and he and Sheppard got on the bucket and rang one bell. As the bucket started, Sheppard slipped off and caught on the side of the bucket with his hands. He held on until the bucket had ascended about 60 feet, when he called to stop the bucket. In endeavoring to get a fresh hold, he slipped and fell to the bottom. Doyle was hoisted to the surface and immediately sent the bucket to the bottom of the shaft, but Sheppard must have been so injured by the fall that he was unable to get into it. The four shots were shortly afterwards heard. As soon as possible the contractors, McDonald and Kenty, went down into the shaft and found Sheppard completely buried in the muck.

The work of sinking the shaft was being done by contract from the Goodwin Lake Mining Company. The shaft was found to be 90 feet in depth and was timbered to within 25 feet of the bottom, but there was no auxiliary ladder in place at the time of

the accident. Both the Goodwin Lake Mining Company and the contractors, McDonald and Kenty, were prosecuted under section 164, subsection 23, of the Mining Act, and were fined $100 each and costs.

The coroner's jury brought in a verdict of accidental death, but censured the Company and the contractors for violation of the Act.

Hargrave Silver Mine

At the Hargrave mine on June 8th, John Welsh, machine runner, and W. J. Parkinson, machine helper, were both accidentally killed by a premature explosion of dynamite.

The accident occurred in the drift of the 375-foot level of No. 3 shaft. A round of 13 holes was completed about 11 o'clock, and the first round of three holes was blasted before 12 o'clock. The second round of three holes was fired about one o'clock, and half an hour afterwards one hole was blasted. Seventy-five sticks of dynamite in all had been sent down with caps and fuse. Welsh and Parkinson went into the drift to load another round, and about 10 minutes after, the explosion was heard which killed both men. None of the holes were loaded, and it is impossible to say just what caused the explosion. It is probable that they attempted to clean out an old hole that contained some dynamite.

The coroner's jury brought in a verdict of accidental death.

Helen Iron Mine

At the Helen iron mine on August 6th, Antonio Micetich, track-man, was killed by being caught between the guard-rail of the cage and the shaft set, while trying to ring the bell when the cage was in motion.

The deceased was employed in the mine as track-man and had been in the employ of the company for upwards of six months. On the night of the accident, at about 11 o'clock, the deceased had put four rails on the cage at the surface, and had gone down to the fifth level, where the cage was stopped and N. Harman, pump-man, got on with him. The deceased then rang the signal for the cage to be lowered to the sixth level, but, through some error either in ringing or transmitting, the hoist-man received the signal to hoist. As the cage started up the deceased leaned out and tried to ring the signal to stop. In so doing he was caught between the first shaft set above the level and the guard-rail of the cage, and crushed.

The coroner's jury brought in the following verdict: "That Antonio Micetich came to his death through an accident due to his own carelessness, being caught by a shaft timber while trying to ring the signal from a moving cage.

Hudson Bay Silver Mine

At the Hudson Bay mine, on September 9th, J. R. Kinler, manager of the mine, was killed by falling from a high concrete pier at the mill.

Mr. Kinler, in company with Mr. McMillan, the mine captain, was looking over the construction work at the mill and was standing on a concrete abutment about 25 feet above the cement floor. While standing there he gave instructions to have some of the framework taken down. He assisted in this work, and was struck by the frames when they were loosened, and thrown backward off the abutment. He sustained a fracture of the base of the skull and died in less than an hour.

The coroner's jury brought in the following verdict: "That James R. Kinler came to his death by accident on September 9th at the Hudson Bay mine, by falling from the mortar block to the cement floor."

Kerry Silver Mine

At the Kerry mine, on June 7th, Obar Coutu, machine helper, was killed by being struck by a rock falling from the back of the drift in which he was drilling.

Coutu and his partner were engaged drilling a number of short holes at intervals of 50 feet, in which wooden plugs were to be placed for holding electric wires for lighting purposes. They were using an air hammer drill, and had drilled several holes. The

runner started the hole which caused the accident and had drilled about 4 inches when his helper took hold of the drill, while the runner went to the shaft for steel. He had got only about 50 feet away when his helper shouted. He went back and found that a piece of rock, weighing about 250 pounds, in which the hole was being drilled, had fallen, striking Coutu on the head and chest, from which injuries he died the following morning.

The coroner's jury brought in a verdict of accidental death.

La Rose Silver Mine

At La Rose mine, on April 21st, Patrick Gilmour, laborer, sustained a fracture of the ankle. He was taken to the hospital at Cobalt, where he made satisfactory progress untill April 28th, when he died very suddenly.

A post-mortem examination was conducted by Drs. Hair and McLean, who gave evidence that the repair of the fracture was progressing rapidly, but that the heart was practically empty of blood, and the muscles very pale, soft and flabby. They stated his death was due to the sudden cutting off of the blood from the heart. The accident which resulted in his fractured ankle was caused by Gilmour falling from a platform a distance of about seven feet.

The coroner's jury brought in the following verdict: "That Patrick Gilmour came to his death suddenly at the Red Cross hospital on April 28th, due to causes unknown."

Marathon Silver Mining Company

At the Marathon mine, on October 26th, Hugo Manderstrom, miner, was killed through the breaking of a ladder-rung causing him to fall about 50 feet into the shaft.

On the morning of the above day a round was fired in the shaft, (which was 69 feet deep) that broke the landing on the lower set of timbers about 20 feet from the surface. In the afternoon Manderstrom, with the help of a couple of other men, took one of the 20-foot ladders, tied a 1½-inch rope to it and lowered it down through the manway, so that he could repair the landing which had been blasted. He then started down the ladder and had got down 10 or 12 feet when the rungs to which the rope was tied broke, and he fell to the bottom of the shaft. When he was taken out of the shaft it was found that his skull was fractured. He died shortly afterwards.

The coroner's jury brought in the following verdict: "That Hugo Manderstrom was killed in the shaft of the Marathon mine, on October 26th, through the accidental breaking of a ladder causing him to fall down the shaft."

McDonald Feldspar Mine

At the McDonald feldspar mine, on September 7th, Wm. Campsall, mucker, was killed by being struck by falling rock.

The open cut in which Campsall was working was about 40 feet in depth, with a hanging wall dipping about 70 degrees. According to the evidence taken at the inquest the walls of the open pit had been scaled a short time before the accident happened. No blasting had been done in that part of the open pit on the day of the accident. The rock fell from the wall about 20 feet above where Campsall was standing. It weighed between 200 and 300 pounds, and the blow caused a fracture of the skull. Campsall died about 40 hours later.

The coroner's jury brought in the following verdict: "That Wm. Campsall came to his death at the McDonald feldspar mine by being struck by a rock falling from the wall; that the wall of the mine was unsafe on account of insufficient scaling."

Mond Nickel Company

Garson Mine

At the Garson mine, on May 12th, Frank N. Silver, student, was electrocuted.

The deceased had been employed at the mine a little over a week, and had been part of that time helping the electrician. On the night of the accident he was

working as helper on a machine underground. At noon he went into the powerhouse along with the hoistman and engineer and ate his dinner there. When finished he picked up his dinner pail and started to leave the powerhouse. No notice was taken of what he did until 10 minutes later, when the engineer found him lying alongside one of the transformers. On investigation it was found he had placed his dinner pail back of one of the transformers, and, in so doing, the candle stick in his hat came in contact with one of the 22,000-volt wires, killing him instantly.

The coroner's jury brought in a verdict of accidental death.

At the Garson mine, on October 29th, Albert Johnson, drill helper, was killed through being struck on the head by a falling rock.

The accident occurred in an open pit about 30 feet long, 12 feet wide and 40 feet deep. The deceased was working in a cutting-in stope back from the open pit. He had just finished drilling and was coiling up the hose under the brow of the open pit preparatory to blasting, when the rock fell. The rock that fell came from the hanging wall near the surface, and had apparently been loosened through the freezing of water in the cracks of the rock.

The coroner's jury brought in the following verdict: "That Albert Johnson came to his death as a result of injuries sustained on October 29th, by being struck by a falling rock in No. 14 pit of the Garson mine, and that no person could be held responsible, as the defect in the wall upon close examination could not be detected."

Smelter

At the smelter of the Mond Nickel Company, at Victoria Mines, on December 8th, John Baby, converter liner's helper, was killed through being jammed between a ladle and a converter former.

The deceased had been engaged at his work lining the converter on the day of the accident until about 12.30 p.m. when he got down on the converter floor to put a chain on a converter former. The craneman was signalled to come over and lift this former into the converter shell. In accordance with the signal the craneman brought the crane over the former and was running a small block over to it, when it caught on the flange of a ladle near the former and upset it against John Baby, jamming him between the former and the ladle. Baby was taken to the hospital as soon as possible, but it was found that he was seriously injured internally.

The coroner's jury brought in the following verdict: "That John Baby came to his death on December 11th as a result of injuries sustained on December 8th, in the smelter of the Mond Nickel Company by being crushed underneath an overturned ladle, the said ladle being caught by the hook of a chain attached to a travelling crane. That his death was purely accidental and not due to any culpable negligence on the part of his fellow employees."

Moose Horn Silver Mine

At the Moose Horn mine, on November 19th, Geo. Allandale, mucker, was killed by an explosion caused by picking into a piece of gelignite in the muck.

Geo. Allandale and Daniel Kerney were mucking in a winze about 15 feet deep on the 100-foot level. Three rounds had been fired in the winze on November 17th. The foreman reported that he had received all the reports. On the morning of the 19th there were still four or five buckets of muck to hoist, and Allandale was using a pick to break up the loosened rock when the explosion occurred.

The coroner's jury brought in the following verdict: "That George Allandale came to his death from an explosion of gelignite and that there is a possibility that it was due to a cutoff hole, and, if such was the case, it showed negligence on the part of the company."

Northland Pyrites Mine

At the Northland mine, on March 29th, Saunders H. Frayne, drill helper, was killed by falling into a winze between the second and third level. A winze had been sunk on the ore from the second to the third level, about 50 feet north of the shaft,

and underhand stoping to this winze started about a month previously. At the time of the accident the lower bench in this stope was about 24 feet below the level. On this lower bench Frayne and his partner were at work. Frayne had his back to the winze and was tightening a nut on the machine when his wrench slipped, and he fell backwards into the winze, a distance of about 40 feet, and was instantly killed.

The coroner's jury brought in a verdict of accidental death.

Nova Scotia Silver Mine

At the Nova Scotia mine, on January 17th, C. Schmidt, laborer, received injuries by falling from a ladder, which resulted in his death about two days later.

The deceased was carrying a band of iron up a ladder leaning against a water tank. When about 12 feet from the ground the ladder canted, and the deceased lost his balance and fell sideways to the ground. In falling he struck his head on a plank. The doctors stated that the cause of death was injury to the brain substance causing inflammation.

The coroner's jury brought in a verdict of accidental death.

O'Brien Silver Mine

At the O'Brien mine, on May 5th, Wm. Jones, electrician, was killed by being thrown from an empty car that got beyond his control.

The deceased had been employed at the O'Brien mine about three months' as electrician. On account of the illness of the regular motorman, Jones had been put on to run the motor on the morning of May 5th. He had taken one car from No. 1 shaft down to the mill, coupled on two empties and was pushing them ahead of the locomotive down to No. 6 shaft. Just as he got on the grade going to the shaft he stopped the locomotive, and, for some reason unknown, pulled the lever which disengaged the coupling, and the head empty immediately started down grade. He at once started after the car, got into it and attempted to stop it by putting on the brake, but the car had got beyond his control. On account of the grade, the car was gathering speed all the time. It rounded the first curve, but when it came to the second it upset, throwing Jones out of the car. His head struck a stump, which caused a fracture of the skull. He died a few hours later.

The coroner's jury brought in a verdict of accidental death.

Ophir Silver Mine

At the Ophir mine, on September 21st, John Kinsey, pumpman, was killed by falling from the second to the third level, a distance of 100 feet.

The deceased was working around the sinking pump on the landing of the 200-foot level and accidentally stepped into the open shaft which had no guard-rail round it. He received injuries which resulted in his death the following day.

The coroner's jury brought in the following verdict: "That John Kinsey came to his death at the Ophir mine by falling down a shaft. That we censure the Ophir mine for neglecting to make provision for protecting the sides of the shaft by means of a guard-rail."

The Ophir Mining Company were prosecuted under section 164, rule 19, by the Inspector of Mines and fined $100 and costs.

Rochester Silver Mine

At the Rochester mine, on October 26th, John Dow, machine helper, was killed by falling into a winze 75 feet in depth.

John Dow and Wm. Burley were lowered into the winze to see if all the holes that had been blasted a short time previously had broken. They remained down about 15 minutes when they gave the signal to hoist. The bucket was hoisted to the collar of the winze and Dow started to get on the landing. In some way unknown he slipped and fell to the bottom of the winze.

The coroner's jury brought in the following verdict: "That John Dow came to his death as a result of injuries received by accidentally falling down a winze at the Rochester mine on October 26th."

Shamrock Silver Mine

At the Shamrock mine, on August 30th, Alex. Clark, machine runner, was killed by being jammed between the cage and the timber while riding up on the cage.

Clark's place of work was on the 300-foot level. He had been at the surface just before 11 o'clock and then went down on the cage to the 300-foot level, got off, and lighted his lamp but did not start work. He complained of a headache and decided to again go to the surface. When the cage was up about 35 feet the hoistman felt a jar and stopped the cage. An investigation was made and Clark was found jammed between the timbers and the cage. He was taken out promptly, and sent to the hospital, but died a few days later. Probably the explanation of the accident is that Clark, who was feeling unwell, took a faint or dizzy turn when the cage started and fell to the floor of the cage. His legs projecting over the platform caught on the shaft timbers.

The coroner's jury brought in the verdict, "That Alex. Clark came to his death accidentally, the result of injuries received at the Shamrock mine on August 30th, by being caught between the cage and the timbers of the shaft. We recommend that all mines have a bell rope in the working compartment of the shaft."

Silver Leaf Mine

At the Silver Leaf mine, on January 31st, Jas. Hope, drill runner, and Alex. Cristea, helper, were killed by a premature explosion, while engaged in lighting a round of holes in the shaft.

The accident occurred at the bottom on a 264-foot shaft. On Saturday, January 29th, a round of 18 holes had been completed, and Hope and his partner loaded 8 of them, using time-delay fuse for firing. They had great difficulty in getting this round fired, and, after trying several times, found that only 4 of the 8 holes exploded. They tried again on Monday morning, but succeeded in getting only 3 reports out of 6 holes connected. They then discarded the time-delay fuse and decided to use ordinary time fuse. They had loaded 13 holes, and the hoistman got the blasting signal and replied. About 30 seconds later an explosion was heard. About a minute later another report was heard, and, after waiting a few minutes, a couple of workmen were lowered to the bottom. Both men were dead before they were brought to the surface.

It is impossible to say what was the cause of the premature explosion. It may have been due to a fuse spitting into an untamped hole.

The coroner's jury brought in a verdict of accidental death, cause unknown.

Temiskaming Silver Mine

At the Temiskaming mine, on May 25th, Fred Bamber, head ore-sorter, while leaning over the guard-rail at the second landing in the shafthouse, was struck by the descending cage, causing him to fall down the shaft, and killing him instantly.

Bamber had apparently walked out of the rockhouse to the shaft and leaned over the guard-rail when the cage was at the landing above. The cage when lowered struck him on the back of the head, causing him to fall into the shaft. He fell a distance of about 400 feet, and landed on the hood of the cage, which was displaced by the fall, dropping him into the bottom of the car which was on the cage.

The coroner's jury brought in the following verdict: "That Fred Bamber came to his death at the Temiskaming mine, on May 25th, accidentally by falling down the shaft. We find the company free from all blame."

Trethewey Silver Mine

At the Trethewey mine, on August 24th, A Lefebvre, painter, was electrocuted through coming in contact with the high pressure wire while at work on the transformer building.

Lefebvre had been in the employ of the company for several months doing general painting round the mine. He had completed nearly all the odd jobs round the buildings with the exception of a board just above the point where the high pressure wires enter the transformer building. There appears to have been no definite instructions given to Lefebvre to paint this board. He had been warned by some of his fellow workmen to be careful when working near the wires, but did not realize the full importance of this warning. The men working on the top of the building heard a report and saw a flash of light. On investigating they found Lefebvre on the wires which carry 11,000 volts. It was necessary to get the current shut off before he could be removed from the wires, which required about 25 minutes.

The coroner's jury brought in the following verdict: "That A. Lefebvre came to his death at the Trethewey mine, on August 25th, by accident due to electrocution. That we strongly censure the Trethewey Mining Company for their carelessness in permitting their employees to work in such close proximity to wires carrying such high voltage as 11,000 volts. That signs be placed on all transformer houses and switch boards, giving the voltage in French and English."

At the same mine, on December 9th, Wm. Maki, drill runner, was killed through the breaking of a rope in hoisting his machine out of the winze.

Maki was working in a winze 60 feet deep below the 150-foot level. He had completed the drilling of a round of holes and was sending his machine and tools to the top before blasting. The shift boss told him to put his machine in the bucket and send it up as usual. Instead of doing this, Maki fastened a piece of rope that had been used in tying tools in the bucket, around the machine, and gave the signal to hoist. When the machine had reached a point about 20 feet from the top the rope broke, allowing it to fall, striking Maki on the head and fracturing his skull.

The coroner's jury brought in the following verdict: "That Wm. Maki came to his death accidentally as a result of injuries received at the Trethewey mine, on December 9th, by being struck by a falling machine that was being hoisted attached to the cable by a rope, by the deceased, which was contrary to orders."

Table of Fatal Accidents in 1910

Date.	Mine or Workings	Owner.	Name and Occupation of Injured.	Below Ground.	Above Ground.	Nature of Injury.	Cause of Accident.
April 24..	Blast furnace.....	Algoma Steel Co.....	Giovanni Buzzato, laborer.....	....	1	Body badly burned.....	Slip of furnace expelled hot coke which ignited clothing.
June 12..	do	do	Daniel McLeod, top hoistman	....	1	Burned	Hot gases expelled by slip in furnace.
Sept. 16..	Atikokan	Atikokan Iron Co.....	Aleck Oja, machine man.....	1	....	Skull fractured	Struck by falling rock.
Nov. 4...	Beaver	Beaver Consolidated Mines, Ltd.....	Mytro Poirer, mucker	1	....	Both legs broken and head injured.....	Fell down winze.
Feby. 8..	Bishop	Bishop Silver Mines, Ltd...	Olaf Moseid, hand miner	1	....	Legs broken and bad flesh wounds.....	Explosion in blasted hole while cleaning it out.
Feby. 10.	Creighton.....	Canadian Copper Co.....	John Irish, scaler.....	1	....	Leg broken and foot crushed,	Large piece of ore fell on him while scaling.
June 8...	Smelter	do	Artymon Kukulnisk, laborer.....	....	1	Rupture of small intestine, causing peritonitis,.....	Struck on abdomen by bar.
Aug. 26..	do	do	D. L. Antonio, converter man.....	....	1	Ribs broken and crushed in, causing internal injuries....	Crushed between converter ladle and car.
Sept. 8...	Creighton.....	do	Yojo Wanio, machine man.....	1	....	Body crushed	Struck by falling rock.
Oct. 4....	do	do	Peter Klorodiski, block holer.....	1	....	Legs badly lacerated,.....	Drilled into unexploded block hole.
Nov. 15..	do	do	Alex. Billinski, mucker.....	1	....	Skull fractured,.....	Struck by rock rolling down muck pile.
Nov. 24..	Smelter	do	Enrico Bedino, shift boss	....	1	Skull fractured,.....	Struck by falling shear leg.
Dec. 22..	No. 2.....	do	John W. Kauppi, drill helper	1	....	Body crushed.....	Run over by skip while attempting to leave it near surface.
June 30..	Railway.....	Manitoulin North Shore Ry. Creighton Yd's.....	Samuel Eyre, brakeman.....	....	1	Leg severed	Run over by cars.
Aug. 19..	Stone Quarry.....	Canada Cement Co.....	Allan Brant, trammer.....	1	....	Fractured skull	While using rail as lever to replace car on track it slipped and fell on him.
Dec. 5...	Blast furnace.....	Canada Iron Corporation....	Angus Crossen, repair man.....	....	1	Asphyxiated,.....	While cleaning out ore chute at top of furnace was
May 26...	Casey	Casey Cobalt M'g. Co.....	John Loucks, trammer.....	1	....	Head injured, causing concussion.....	overcome by furnace gas. Struck pick into gelignite in bottom of old hole, causing explosion.
May 4....	City of Cobalt....	City of Cobalt M'g. Co.....	Oliver Martel, machine runner.....	1	....	Top part of head blown off,..	Started to drill into bottom of old hole causing an explosion.
Sept. 28..	Smelter	Coniagas Reduction Co.....	Antonio Tario, laborer.....	....	1	Body crushed	Large radiator coil which was being moved fell on him.
Nov. 16..	Cobalt Union	Cobalt Union Mines, Ltd...	Stephen Labelle, mucker.....	1	....	Skull fractured,.....	Struck by falling bucket due to breaking of eye bolt in horse whim.
Aug. 8...	Smelter	Deloro Min. & Reduction Co	Jan Koztouski, laborer.....	....	1	Electrocuted,.....	While handling switch in stopping motor received
Nov. 23..	do	do	Samuel Milligan, foreman.....	....	1	Severely burned, pneumonia was contracted, causing death Dec, 3rd,.....	shock. Burned by fall of hot flue dust.
July 30...	Rex Flinn.....	A. Rex Flinn	Tony Colletto, labourer.....	....	1	Badly crushed.....	Caving in of trench.
Jan. 15..	Goodwin.....	Goodwin Lake Mines Co....	Frank Sheppard, drill helper.....	1	....	Body very badly cut.....	Fell from bucket while riding away from blast and was struck by blast.
June 8...	Hargrave.....	Hargrave Silver Mines	John Welch, machine runner.....	1	....	Skull fractured.....	While loading a round of holes a premature explosion
do	do	do	W. J. Parkins, machine helper.....	1	....	Head blown off.....	occurred.
Sept. 9...	Hudson Bay.....	Hudson Bay M'g. Co.	J. R. Kinler, manager.....	....	1	Skull fractured	Fell from high concrete pier of mill.
June 7...	Kerry	Kerry Mining Co.....	Obar Coutu, machine helper.....	1	....	Laceration and fracture of the skull.....	Piece of rock in back of drift into which he was drilling, fell on him.
April 21..	La Rose.....	La Rose Mines, Limited.....	Patrick Gilmore, labourer.....	....	1	Ankle fractured.....	Died in seven days, death due to sudden cutting off of blood from the heart.

Table of Fatal Accidents in 1910—Concluded.

Date.	Mine or Workings	Owner.	Name and Occupation of Injured.	Below Ground.	Above Ground.	Nature of Injury.	Cause of Accident.
Aug. 6...	Helen	Lake Superior Power Co....	Antonio Micetick, trackman.....	1	....	Injuries to lungs and bronchial tubes, causing hemorrhage.....	Trying to ring bell when cage was in motion, was caught between guard rail and shaft set.
Dec. 31..	Craigmont	Manufacturers Corundum Co	Fred Molkentien, foreman	1	....	Head blown off	Explosion of delayed blast.
Oct. 26...	Marathon.....	Marathon M'g. Co.....	Hugo Manderstrom, miner.	1	....	Fracture of base of skull.	Ladder rung broke allowing deceased to fall about fifty feet into shaft.
Sept. 7...	McDonald.....	McDonald Feldspar Co.	Wm. Campsall, mucker	1	....	Fracture of skull.....	Struck by falling rock.
May 12...	Garson.....	Mond Nickel Co.....	Frank N. Silver, student	....	1	Electrocuted.....	Touched 22,000 volt wire.
Oct. 29...	do	do	Albert Johnson, drill helper	1	....	Head injured.....	Falling rock.
Dec. 8...	Smelter	do	John Baby, liner's helper.....	....	1	Rupture of intestine.....	Jammed between ladle and converter former.
Nov. 19..	Moose Horn.....	Moose Horn Mines Ltd.....	Geo. Annandale, mucker.....	1	....	Killed almost instantly.....	Picked into gelignite in muck.
Mar. 29..	Northland.....	Northland M'g. Co.....	Saunders H. Frayne, drill helper.....	1	....	Neck broken.....	Fell backward into winze.
Jan. 17..	Nova Scotia.....	Nova Scotia Silver Cobalt M'g. Co.....	C. Schmidt, labourer.....	....	1	Injured brain	Fell from ladder which was leaning against water tank, a distance of 15 feet.
May 5....	O'Brien.....	M. J. O'Brien.....	Wm. Jones, electrician.....	....	1	Fracture of base of skull.	Thrown from empty car which was running away.
Sept. 21..	Ophir	Ophir Mines, Ltd.....	John Kinsey, pump man.....	1	....	Rupture of internal organs...	Fell part way down shaft.
Oct. 26...	Rochester.....	Rochester Cobalt Mines, Ltd.	John Dow, drill helper.....	1	....	Internal injuries.	While stepping off bucket slipped and fell into winze.
Aug. 30..	Shamrock.....	Shamrock Silver Mines, Ltd.	Alex. Clark, machine runner.....	1	....	Fracture of base of skull.....	While riding upon cage jammed between cage and timber.
Jan. 31..	Silver Leaf.	Silver Leaf M'g. Co.....	Jas. Hope, drill runner	1	....	Killed instantly.....	While lighting round of holes in shaft, one hole exploded prematurely.
do			Alexander Cristea, helper	1	....		
May 25...	Temiskaming	Temiskaming M'g. Co.....	Fred Bamber, head ore sorter.....	....	1	Head crushed	Struck by descending cage while leaning over guard rail in shaft house, causing his fall down shaft.
Aug. 24..	Trethewey.....	Trethewey Silver Cobalt M'g. Co.....	A. Lefebvre, painter.....	....	1	Electrocuted.....	Touched high pressure wire while working in transformer building.
Dec. 9...	do	do	Wm. Maki. drill runner.....	1	....	Fracture of skull.....	Sent up drill by means of rope tied to cable, rope broke allowing it to fall and striking Maki.
			Total.....	29	19		

Table of Non-Fatal Accidents in 1910

Date.	Mine or Workings	Owner,	Name and Occupation of Injured.	Below Ground.	Above Ground.	Nature of Injury.	Cause of Accident.
July 7....	Atikokan	Atikokan Iron Co.....	A. Neilson, powderman	1	....	Bruises and flesh wounds ...	Premature explosion of sand blast.
Feb. 21..	Belmont	Belmont Mines, Ltd.	W. C. Dean, machine man	1	....	Fracture of ankle.....	Slipped from ladder and fell 25 feet.
Feb. 12..	Bonsall	The Bonsall Mines, Ltd.....	John Daniels, engineer.....	....	1	Left leg broken	Using a bar to start compressor.
April 7...	Buffalo.....	Buffalo Mines, Ltd.....	Geo. Cleverly, miner	1	....	Eye injured.....	Premature explosion while fixing sand blast.
Aug. 6...	do	do	P. Ricketts, drill runner	1	....	Spine seriously injured.....	Slipped while descending manway, falling on rail
Feb. 24..	Creighton.....	Canadian Copper Co.....	Kalli Lapala, drill runner.....	1	....	Lost sight of one eye.....	Struck by small piece of rock from drill.
Dec. 14..	do	do	Kantala Rousouen, drill helper.	1	....	Fracture of right thigh and left leg.....	Fell down stope about 20 feet.
Dec. 31..	Cobalt plant.....	do	Chas. Hankin, oiler	....	1	Head injured.....	Arm caught between belt and pulley.
Nov. 18..	Queensboro	Canadian Sulphur Ore Co...	A. Jeffery, drill runner....	1	....	Fracture of arm.....	While hoisting cross-bar out of shaft, chain broke, allowing bar to fall.
May 4....	City of Cobalt....	City of Cobalt M'g. Co.....	John Murphy, drill helper.....	1	....	Arm broken.....	Runner started to drill in bottom of old hole, causing explosion.
June 24..	do	do	A. Larson, miner	1	....	Arm broken.....	Brake pin came out, dropping cage with men 60 feet.
do	do	do	J. K. Regan, miner.....	1	....	Ankle cut.....	
Nov. 2...	Quarry	Clifton Sand, Gravel and Construction Co.....	Arthur Lenahan, laborer.....	....	1	Fractured skull	Struck by sheave falling from derrick.
July 19...	Townsite	Cobalt Townsite M'g. Co. ..	E. Johnson, machine runner.....	1	....	Right arm injured requiring amputation	While loading hole with gelignite, premature explosion occurred.
do	do	do	H. Hakala, machine helper	1	....	Flesh wounds.....	
Dec. 12..	Smelter	Canigas Reduction Co.....	E. J. Hilton, labourer.....	....	1	Rib broken	Wall collapsed while tearing down brick furnace.
Sept. 14..	Crown Reserve...	Crown Reserve M'g. Co	Edward Boves, miner	1	....	Fractured toe	Bucket fell on toe.
Dec. 8...	Smelter	Deloro M'g.& Reduction Co.	A. Savory, helper.....	....	1	Cut behind ear.....	Hit by handle of winch.
Feb. 16..	Frontier.....	Haileybury FrontierM'g.Co.	Lauzon Fournier, miner.....	1	....	Lost sight of one eye.....	Struck by pick.
July 22...	Blast furnace.....	Hamilton Steel & Iron Co...	Pasqualino Unsca, labourer.....	....	1	Foot crushed....	Caught in hoist.
Sept. 5...	do	do ...	Jas. Casali, labourer	....	1	Right wrist broken.....	Hoist started, causing him to fall.
Nov. 18..	do	do ...	Roco Violo, labourer.....	....	1	do	Struck on wrist by falling wedge.
May 9....	Hollinger	Hollinger M'g. Co	Jas Williams, drill helper	1	....	Eye severely injured.....	Picked into some loose gelignite in muck.
do	do	do	J. Gagnon, drill runner.....	1	....	Head cut.....	
Sept. 5...	do	do	John Knash, mucker.....	1	....	Injured under right eye	Struck loose detonator in muck with pick.
Jan. 19..	Richardson	Kingston Feldspar& M'g.Co,	Stuart Leeman, pit boss.....	1	....	Three fingers broken.....	Hand caught in sheave wheel.
May 31...	Helen	Lake Superior Power Co. ...	S. Matizezuk, trammer.....	1	....	Finger crushed	Jammed between wall and car.
May 26...	Magpie.....	do	Whitori Makela, labourer.....	....	1	Foot cut.....	Struck foot with adze.
Aug. 23..	Helen	do	John Jones, miner.....	1	....	Very badly cut up.....	Box of caps exploded.
Sept. 22..	do	do	E. Tomicie, miner.....	1	....	Bruised.....	Fell down raise.
Sept. 27..	do	do	W. Kowunen, miner.....	1	....	Scalp wound.....	Slipped while tightening nut on machine and fell down raise.
Oct. 5....	do	do	J. Falco, trammer.....	1	....	Right hand bruised	Caught between car and wall.
Oct. 12...	do	do	Wm. Harris, skip tender	1	....	do	Caught between car and wall.
Oct. 18...	do	do	J. Ranelink, trammer.....	1	....	Shoulder blades bruised	Struck by ore falling down chute.
Oct. 26...	Magpie.....	do	Fred Aozak, labourer.....	....	1	Fracture of finger and bruises.	Barrel of gasoline fell on his hand.
Nov. 2...	Helen	do	R. De Diana, miner.....	1	....	Cut on head.....	Struck by piece of rock from blast
Nov. 17..	do	do	A. De Bon, trammer.....	1	....	Left ankle sprained, other bruises.....	Struck by falling material.
Nov. 24..	do	do	Paul Paghwekine. trammer.....	1	....	Right thumb broken.....	Rock fell down chute and struck thumb.
Nov. 13..	do	do	W. Moore, labourer.....	....	1	Leg bruised, causing septic condition	Struck by stone.
Dec. 9...	do	do	G. Zanzi, trammer.....	1	....	Fracture of finger.....	Lump of ore struck finger when on edge of car.

Table of Non-Fatal Accidents in 1910—Concluded

Date.	Mine or Workings	Owner.	Name and Occupation of Injured.	Below Ground.	Above Ground.	Nature of Injury.	Cause of Accident.
Dec. 20..	Twp. 22, Range 12	Lake Superior Power Co....	Jos. Bolduc, labourer.....	....	1	Left hand blown off.....	Premature explosion of dynamite.
Dec. 31..	Helen	do	N. Martignago, miner.....	1	....	Fracture of right ankle	Timber fell on him.
Jan. 26..	La Rose.....	La Rose Mines, Ltd.....	A. E. Burt, sampler.....	1	....	Right leg fractured.....	Fell from ladder while descending into stope.
Feb. 17..	do	do	A. Myrinayk, trammer	1	....	Leg bruised.....	Jammed between two cars.
Mar. 17..	do	do	R. Chartrand, timberman	1	....	Leg and arm bruised	Loosened piece of rock while scaling, which fell on him.
July 30...	Lawson	do	F. De Rico, labourer	....	1	Leg bruised.....	Trench 4 feet deep, caved in.
Aug. 8...	La Rose..... ...	do	L. Hatt, drill runner	1	....	Bruised knees.....	While scaling, loosened rock which fell on him.
Aug. 31..	do	do	R. Gilchrist, drill helper.....	1	....	Finger amputated.....	Caught between drill and bar.
Nov. 10..	do	do	A. Morin, mucker.....	1	....	Big toe crushed.....	Caught between bucket and car.
April 14..	Little Nipissing..	Little Nipissing Silver Cobalt M'g. Co.....	John Smith miner.....	1	....	Thumb smashed	Rode down shaft on bucket, contrary to orders.
Oct. 25...	Lumsden.....	Lumsden M'g. Co.....	Wm. Dellenko, helper.....	1	....	Head bruised.....	Fell about 25 feet down shaft
Aug. 4...	Craigmont	ManufacturersCorundumCo.	David Kilmartin, millman.....	....	1	Fracture of thigh	Throwing belt off pulley.
Dec. 31..	do	do	Wm. Tracy, helper	1	....	Left eye destroyed.....	Caught by explosion.
June 13..	Savage.....	McKinley-Darragh-Savage Mines, Ltd.....	Nathan Bradley, machine man	1	....	Fingers blown off both hands.	Cleaning out old hole.
Feb. 26..	Smelter	Mond Nickel Co.....	Geo. Smith, mechanic.....	....	1	Leg broken	Piece of sheet iron on which they were standing gave way.
do	do	do	John Tracey, mechanic	....	1	Head injured.....	
June 16..	do	do	Matti Wanki, trammer.	....	1	Leg fractured.....	Jammed by ore car.
June 7...	Nova Scotia.....	Nova Scotia Silver Cobalt Mines	J. Kawal, cage tender.....	1	....	Internal injuries.	Piece of steel caught on timber jamming him against floor of cage.
Aug. 12..	Rochester	Rochester Cobalt Mines,Ltd.	A. M. Polson, hoistman.....	1	....	Bruised.....	Fell 20 feet into winze.
Dec. 19..	Cobalt Central Mill	Standard Cobalt Mines.....	Rober Carter, jigman.....	....	1	Head bruised.....	Struck by wrench, which had come in contact with fly wheel of crusher.
Nov. 14..	Swastika.....	Swastika M'g. Co.....	Malcolm McLaughlin, engineer	....	1	Leg broken, necessitating amputation	Using bar to start compressor.
Jan. 14...	Temiskaming	Temiskaming M'g. Co....	K. Sivin, drill runner.....	1	....	Hand bruised	Piece of rock fell on hand.
Aug. 13..	do	do	Felix Knash, miner	1	....	Back sprained.....	While being lowered in cage, hoistman threw left hand drum out of gear, brake not on right hand drum, and cage dropped about 40 feet.
do	do	do	N. Yanta, miner.....	1	....	Leg injured	
do	do	do	D. Maki, miner	1	....	Fracture of forearm.....	
Jan. 22..	Waldman	Waldman Silver Mines, Ltd.	John Whalen, tender.....	....	1	Right arm broken.....	Caught between car and door of shaft house.
July 6....	do	do	Frank McCumber, trammer	1	....	Fractured finger.....	Hand caught between car and chute.
			Total.....	47	20		

MINES OF ONTARIO

BY E. T. CORKILL, Chief Inspector of Mines

I.—NORTHWESTERN ONTARIO

Northwestern Ontario comprises an area extending from Port Arthur north to the Albany river and west to the Manitoba boundary. Throughout this area mines are being worked for gold, silver, iron and iron pyrites. In addition, sandstone and granite are being quarried for building purposes, for concrete work and for street paving. All this area is more or less mineralized, and mines are, or have been, in operation over much of the explored part. Gold appears to be the most widely distributed mineral, and for the winning of it the most development work has been done. The gold mines have had a most uncertain existence. Some of them have produced considerable gold, for example, the Mikado, Sultana and Regina. Of these the Mikado is the only one in operation at present. This mine produced, up to the time the old company ceased operations in 1903, in excess of $500,000. The last two or three years have seen the least activity in gold mining in this area and the lowest production since 1895. Since the re-opening of the Mikado in 1910, by Capt. H. A. C. Machin, M.P.P., a renewed interest seems to be taken in the district, and it is expected that several other mines will be re-opened in 1911.

Silver mining in the Port Arthur district is still at a low ebb, the production being very small and but few mines in operation.

There was but one shipping iron mine in 1910. This was the Atikokan, which ships to the blast furnace at Port Arthur.

No iron pyrites was shipped from the Northern Pyrites Company's mine near Graham in 1910. The mine was, however, worked steadily, and a considerable tonnage of ore blocked out. Shipments will begin with the opening of navigation in 1911.

The three transcontinental railways of Canada traverse northwestern Ontario. The Fort William branch of the Grand Trunk Pacific runs from Fort William in a northwesterly direction to Graham on the National Transcontinental, a distance of 188 miles, while the Port Arthur and Duluth extends from Stanley Junction on the Canadian Northern southwesterly 40 miles. These several lines, together with the numerous water routes which they intersect, have made accessible a large area of mineral lands and furnish ready means of access to the prospector in his search for mineral.

Lake of the Woods Area

Mikado Gold Mine

This property was re-opened early in 1910, after having been closed down since April, 1903. It is now being worked by the Kenora Mines, Limited, with Capt. H. A. C. Machin, president, and Mr. R. B. Nickerson, superintendent.

The incline shaft put down through the old stopes by the former management is about 1,300 feet in length. The vertical shaft, about 75 feet from the mouth of the incline shaft, is open to the fourth level, a depth of 240 feet, but no work is being carried on through it. The present owners are working on the second, fourth and seventh levels, which are at vertical depths of 120 feet, 240 feet and 360 feet. On these levels drifts are run west on the vein, the seventh level drift being now in 250 feet from the shaft. A winze is being sunk from the fourth to the seventh level.

The mill, consisting of 20 stamps, has been re-modelled and run for some weeks. The old cyanide plant has been taken out, and preparations made for installing a modern mill. The mill is not being run at present, all the force being on development work underground.

The rock-house has been re-modelled and the power plant fitted up and put in operation.

Instructions were given with regard to operating the incline shaft.

Cameron Island

The Cameron Island Syndicate during the winter of 1910-11 made an examination of the Cameron Island mine, situated about 6 miles from the Mikado, and are making preparations for resuming work there.

The Ophir mine, about half a mile south of the Sultana, has been re-opened. A shaft is being sunk.

Work was also done on a copper prospect on an island in Lake of the Woods. A shaft has been sunk about 60 feet and work is still going on.

Upper Manitou Lake Area

With the exception of the Detola, the properties in this area were all idle the first of January, 1911.

Paymaster

The Paymaster erected a 10-stamp mill in 1910, and a month's mill run was made on the output. After this test, operations at the mine ceased entirely.

The Laurentian is still kept un-watered, but no other work is being done.

Detola Gold Mine

The Detola Mining and Development Company, with Mr. Dryden Smith as superintendent, have continued operations at the Detola during the year. The shaft has now a depth of 235 feet, and the second level cross-cuts have been driven 100 feet east and west, respectively.

A 10-stamp mill was erected on the shore of Mud lake during the summer of 1910, and a tramway built from the shaft to the mill.

Minnehaha

On the north shore of Minnehaha lake the Minnehaha Mining and Smelting Company were working at intervals during the year. Very little mining work was accomplished.

Sturgeon Lake

St. Anthony

The only property on which any extensive mining work was carried on during the summer was the St. Anthony. At this mine, under superintendent R. Sandow, the mine was re-opened and mining continued until December 1910, when it was closed down temporarily. While in operation the shaft was sunk an additional 50 feet and further drifting done on the 100-foot level.

An option was taken on this mine by Mr. Geo. Glendenning, of Toronto, in March, 1911, and work again started. It is proposed to run the stamp mill steadily as well as continue the underground development work.

In addition to this mine there were a number of prospectors engaged in assessment work on claims situated in the area around Sturgeon lake. The route to the camp has been described in former reports of the Bureau.

Dryden Area

League Mine

The Shareholders Protective League, Limited, of Detroit, have taken over the old Gold Coin property and were engaged in mining work during the summer of 1910. Mr. Emil Froh, of Detroit, is chairman, and Mr. Jas. J. Kaighan superintendent in charge at the mine.

One shaft has been sunk to a depth of 80 feet, and another, on which work was being done at the time of inspection, 35 feet. The plant consists of a 45-h.p. boiler and hoist.

Vermilion (Northern) Pyrites Mine

The control of this mine, situated on Vermilion lake about 8 miles west of Graham and 2½ miles south of the National Transcontinental railway, was taken over in 1910 from the Northern Pyrites Company by the General Chemical Company. No shipments were made during the year, but development work underground was energetically carried on to prove the extent of the ore body. Both No. 1 and No. 2 shafts have been sunk to the third level, No. 1 being on the hanging wall side of the ore body, and No. 2 in the foot wall; they are about 350 feet apart. On the second level drifts have been run east on the vein 300 feet from No. 2 shaft. No. 1 shaft is connected with No. 2 shaft by a drift along the foot wall in the ore. Cross-cuts have also been driven at 100-foot intervals on this level to ascertain the width of this ore body. On the third level the ore body has been cross-cut from No. 2 shaft.

A new plant is being installed consisting of three 100-h.p.boilers, a 14-drill compressor and double drum hoist for No. 2 shaft. The aerial tram line to the railway is to be repaired, and it is expected to start shipping ore with the opening of navigation this year.

Mr. H. V. Smythe is superintendent, employing about 50 men.

Atikokan Iron Mine

Work was resumed here in May, 1910, and has since been carried on continuously, from 100 to 150 tons per day being shipped to the blast furnace at Port Arthur. The ore is mined from the body about 50 feet from the mouth of the tunnel. Raises were put through east and west of the tunnel, and the ore broken down by underhand stoping. The west stope is about 50 feet in width and the east one 35 feet. An adit has been driven into the ore body at a point 500 feet east of the old workings and some ore taken out.

Mr. F. Rodda is superintendent, employing about 40 men.

Atikokan Blast Furnace

The blast furnace of the Atikokan Iron Company, at Port Arthur, was put in blast in May, 1910, and has since been in operation. Owing to the severity of the winter the company have always ceased work during the winter months until this year.

Mr. J. D. Fraser is manager of both the blast furnace and the mine.

Dominion Bessemer Ore Company

This company did considerable work on lot C, in the township of Macgregor, in 1909, and shipped some ore. They ceased work at the close of navigation that year, and have not resumed operations.

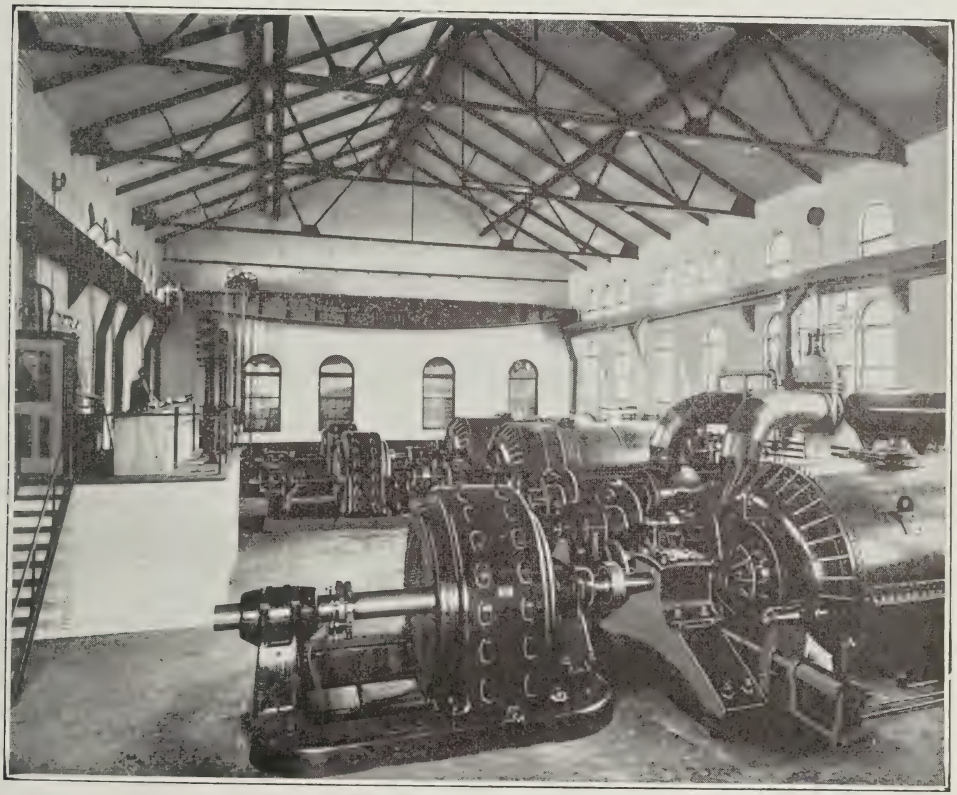
Port Arthur Silver Mines

Very little work was done at these mines in 1910. The West End Silver mine was in operation for a time with a few men, continuing the drifts east on the third and fourth levels of No. 2 shaft. The West Beaver and the Climax were also operated for a short time. Work is being done on an island about 30 miles southwest of Port Arthur under the direction of Mr. R. A. Lockerby, for a Montreal syndicate. A shaft was sunk on a calcite vein a depth of 50 feet and work continued during the winter.

II.—SUDBURY AND THE NORTH SHORE

The production from the Sudbury Nickel mines shows again an increase over the preceding year. This production comes altogether from the mines operated by the Canadian Copper Company and the Mond Nickel Company. The output of the

Canadian Copper Company in 1910 came from the Creighton, Crean Hill and No. 2 mines. A considerable amount of diamond drilling was done at No. 3 mine, and the company state that a large body of ore was located. The production of the Mond Nickel Company was obtained from their Garson and Victoria mines. The Dominion Nickel Copper Company have completed their spur from the mine to the railway, built their rock-house, installed machinery and begun mining. The Moose Mountain Mines, Limited, completed their large magnetic concentration plant in May, 1910, and shipped steadily during the season of navigation. It is now proposed to double the capacity of this concentrator. Shipments from the Helen iron mine at Michipicoten were continued steadily during the season of navigation. The Lake Superior Corporation are



Interior of power house, Huronian Power Company.

developing a property about 18 miles northeast of the Helen, called the Magpie. A branch of the Algoma Central, 9 miles in length, is being constructed to the property, which has been systematically diamond-drilled. A shaft is now being sunk.

The gold properties at Michipicoten are all idle. A number of claims have been staked for gold near Hobon during the winter, but no development work has yet been done on them. The Algoma Central railway is being built north from the Sault to connect with the main line of the Canadian Pacific railway at Hobon. This will give access to a mineralized area that has heretofore been inaccessible.

Canadian Copper Company

The Creighton and Crean Hill nickel-copper mines were worked all year, and No. 2 mine part of the year. The output in 1910 was the largest on record. No. 3 deposit,

about three miles north of Copper Cliff, was diamond-drilled during the year and the company report that a large tonnage of ore was blocked out.

The officers of the company remain unchanged. Mr. A. P. Turner is president and general manager, Mr. John Lawson, general superintendent, and Mr. D. H. Browne, metallurgist.

Creighton Mine

The east end of the ore body has been open-cut to the third level. As the deposit dips to the north, it was found that at the depth of the third level considerable ore had to be left in the hanging wall; besides, the perpendicular wall was difficult of access for scaling. As a result the company decided to take down the overhanging rock on the hanging wall. To facilitate the handling of this waste rock, a cableway was stretched across the open pit, and the rock taken out by means of buckets operated from this cableway. The west part of the ore body above the third level has not been removed, and the stope is partially filled with ore. On the fourth level Nos. 1 and 2 shafts are connected underground, and the ore is mined from the easterly portion of the workings by overhand stoping but not filling. Large pillars are left at neces-



Roast yards, Canadian Copper Company.

sary intervals. In the westerly part of the stope on this level the filling system inaugurated at the Crean Hill mine is used. Drifts are first driven through the ore body and then widened to the walls, leaving pillars where necessary. Slices are then taken off the roof until it is sufficiently high to commence building the dry walls. These dry walls are built by masons and covered with heavy lagging, so that tramways are maintained. At the necessary intervals, ore chutes and manways are carried up in the walls. These are circular in form. The ore is then broken down by back stoping, and the surplus drawn off from the chutes where necessary. At the Creighton, the filling is ore, which has the advantage of always maintaining a large reserve of broken ore in the mine. An air-operated gate, designed by Capt. Lawson, is used to control the flow of ore from the chutes while filling the tram cars.

A new electric-driven compressor has been installed at the second level station of No. 2 shaft. The installation of a compressor underground is a new departure in Ontario. The intake pipe for the compressor is carried down the ladderway of the shaft.

Mr. Wm. Hambly is superintendent at the mine.

Crean Hill

The filling system is used at this mine at all the levels except the second, which is an open cut to the surface. The system differs from that employed at the Creighton, in that waste rock is used for filling and the ore is sorted underground.

Work in December, 1910, was being carried on, on the second, fourth, fifth and sixth levels. From the open pit on the second level some tramming was being done. On the fourth level the filling is about 40 feet above the level. The stope here is about in the form of an equilateral triangle, with each leg 320 feet in length. On the fifth level the fill is about 24 feet above the level. On the sixth level the dry wall has been started on the south wing of the ore body. On the other parts of the level the ore body is being cut out preparatory to beginning the dry wall.

Mr. M. Pickard is superintendent at the mine, employing 150 men.

No. 2 Mine

No work was done in this mine between 1907 and 1910. The shaft is 500 feet in depth to the sixth level. The company were working on the fifth and sixth levels. On the fifth, the ore, which had been broken down from the fourth level floor, making an open cut to the fifth level, was being trammed out. On the sixth level a force was engaged cutting a section of the ore body and back stoping. Mr. J. Ovens is superintendent. The old rock-house has been remodelled, so that the ore is dumped directly into the crusher and then passes over picking belts to the bins. The power house has a compressor and a hoist, which are duplicates of those at the Crean Hill and the Creighton.

Quartz Quarry

In the township of Dill on the Canadian Northern railway, quartz for use at the smelters is mined. About 300 tons a day are shipped. This is all taken out by open-cut work; hoisting is done by derrick. About 45 men are employed.

Smelting Works

The most marked change on which work has been in progress during the last year at the smelter is the building of a reverberatory furnace. Construction work has been going on for some months. The furnace is being erected at the north end of the present smelter building. The other furnaces were in operation throughout the year with increased output. A new basic converter with largely increased capacity has been installed. This basic converter is the largest in use on the continent.

Cobalt Silver Refining Plant

This plant has been enlarged to treat 800 tons of ore per month. A silver refinery and a plant for producing cobalt-nickel hydrate have been installed. The company now ship refined silver, arsenic, and cobalt in its marketable form, there being no demand for refined cobalt. The cobalt-nickel hydrate will be shipped to the European market.

Mond Nickel Company

This company shipped steadily during the year from their Victoria and Garson mines to their smelter at Victoria mines. The second unit of their power plant at Wabageshik falls has been installed, so that the company have two units of 1,200 kilowatts each at 80 per cent. power factor.

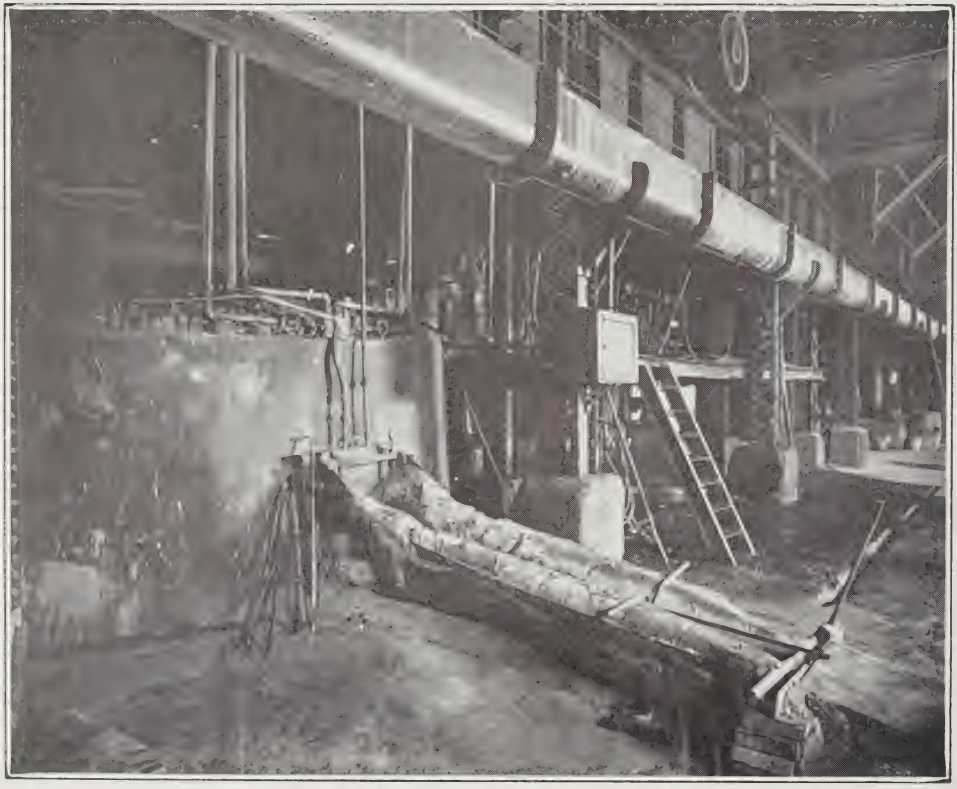
The officers of the company are Mr. C. V. Corless, manager, and Mr. O. Hall, mines superintendent.

Victoria Mines

The main shaft at this mine is now 1,360 feet in depth, the deepest in the Province. The company are working on the fifth, eighth, ninth, tenth and eleventh levels, the other levels having been abandoned. On the fifth level an exploratory drift is being

driven east. On the eighth level the work of cutting out a branch of the west ore body is in progress. On the ninth, the upper section of the 150-foot west ore body is being stoped out, and the east ore body between the eighth and ninth levels has been broken down and is being trammed out. On the tenth a winze has been sunk to connect with a raise from the eleventh level, and the lower section of the ore body is being stoped out. A section has been cut on the east ore body on this level and a raise put up about 30 feet. On the eleventh level the work of tramming ore from the west stope, lower section, is in progress. A section is being cut on the east ore body. The ore bodies between the three lower levels are being taken out in two sections each, on account of the levels having been run 150 and 200 feet apart. The ore is taken by aerial tram from the mine to the roast yards about one mile distant.

About 100 men are employed at the mine.



Settlers of Furnace, Canadian Copper Company.

Garson Mine

The main shaft at this mine is 700 feet in depth, with levels every 100 feet. On the first level stoping is being carried on in the northeast or No. 14, and the northwest or No. 15 stopes. On the second level ore is being taken from stopes Nos. 21 and 26. These stopes have been connected by raises with the first level, and raises have been put through from the first level to the surface. On the third level drifts have been run to the several ore bodies and some stoping done. Very little work is in progress on the fourth and fifth levels. On the sixth level a drift has been run southeast on the ore, a distance of 300 feet from the shaft. On the seventh level the station has been cut.

Mr. A. Sharp is mine superintendent, employing 250 men. The ore is shipped by Canadian Northern railway to Sudbury, and then by the Sault line to the smelter at Victoria Mines.

Smelter

Both furnaces at the smelter are in operation the greater part of the time. Ore is brought by aerial tram from the roast yards about one mile distant. About 50 per cent. of green Garson ore is used in the furnaces. The company have worked out and used successfully a treatment by which the converter slag is poured directly back into the furnace settler, thus saving the cost of re-smelting the slag. A new site for a smelter has been secured near Romford and plans for a new smelter there are being prepared.

Some 200 men are employed at the smelter.

Dominion Nickel-Copper Company

This company have completed their branch line from the Canadian Northern to the mine, and have purchased a locomotive and cars for operation thereon.

A rockhouse has been erected and an 18 x 36-inch jaw crusher driven by two motors of 75 h. p. and 40 h.p. capacity installed. Electric power is obtained from the Wahnapitae Power Company. A power house has been erected and an 1,800-foot compressor driven by a 300 h.p. motor installed. The transformer house is built of concrete.

Mining operations have begun, the ore being mined by open cut work. Mr. J. N. Glidden is in charge, employing a force of 50 men.

Iron

Moose Mountain Mine

An output of about 500 tons of concentrates a day was shipped during the season of navigation to Key Harbor. The ore was mined chiefly by open cut method. The open pit in November, 1910, was about 200 feet wide and 125 feet long, with a face about 65 feet in height. An adit was driven 25 feet below the bottom of the open pit, opening up a stope 75 feet wide. One side of this was broken through to the open cut level. A three-compartment shaft has also been sunk a depth of 100 feet.

The ore is trammed from the open pit and dumped into large pockets, from which it is fed into a series of crushers which reduce the product to 1-inch or under. A belt conveyor then carries it to the mill, 300 feet south, where it is passed over a series of magnetic concentrators. The concentrates are then carried by belt conveyors to a bin over the railway tracks. From this bin it is dumped into cars. The tailings are also carried away by belt conveyors. The whole process of concentration is by the dry method.

Instructions were given regarding the work in the open pit, the fencing of machinery and the thawing of explosives.

Mr. Fred A. Jordan is manager, employing a force of 200 men.

The ore docks at Key Harbor, from which the ore is shipped, have been described in former Reports of the Bureau of Mines.

Michipicoten Area

Mining work in this area during 1910 was confined almost entirely to iron. A little work was done at the Norwalk and Kitchegammi gold mines, but all operations had ceased at the date of my inspection. During the fall and winter a number of claims were staked for gold near Hobon, in township 49, range 27. Little work has as yet been done on these claims, so that the importance of the discoveries has not been ascertained.

Helen Iron Mine

This mine, owned and operated by the Lake Superior Power Company, is the only important producer of hematite in the Province. The production from this mine in 1910 was considerably below that of 1909. This was due to the delay in getting the stopes



Algoma Central Railway. Laying steel near Magpie iron mine.



Magpie iron mine, 1910.

on the sixth level of the mine opened up. As a result large shipments from the mine were not begun till August. From this time until the close of navigation the mine produced about 1,000 tons per day. Iron pyrites was also shipped from the mine, being obtained from beyond the easterly limit of the iron ore on the fifth level of the mine. This body is also being developed on the sixth level.

No. 2 shaft has been enlarged below the sixth level into a 4-compartment shaft and sunk to the eighth level, a vertical depth of about 600 feet. No. 1 shaft is not being sunk any deeper, owing to the nature of the ground that was encountered in the bottom of the shaft. On the seventh level the station has been cut and the work of developing the ore body begun. This will be blocked out similarly to the other levels, by driving a main drift down the centre of the ore body, and then cross-cutting right and left alternately, at an angle of about 50 degrees from the main drift. From these cross-cuts raises are put up at 30-foot intervals. The ore taken out in development work during the winter is hoisted to the upper levels and dumped into worked-out stopes. From these stopes it is drawn when shipping begins at the opening of navigation.

During the winter the work of exploring under Boyer lake has been carried on. To accomplish this drifts are run on the third, fourth, fifth and sixth levels northwesterly under the lake.

New electric pumps have been installed underground and a new dry-house erected near the mouth of No. 1 shaft.

Mr. R. W. Seelye is manager, and Mr. A. Hasselbring superintendent, employing 200 men.

The company use electric power entirely at the mine. The steam plant is kept in reserve, as also the steam pumps, to be used in case of emergency.

Magpie Iron Mine

In township 54, range 26, the Lake Superior Power Company are carrying on important development work on a deposit of siderite and magnetite. The deposit was systematically diamond-drilled during 1910 and the work of sinking a shaft begun. The shaft has four compartments and was, in February, 1911, 115 feet in depth. A straight-line compressor, 125-h.p. boiler and hoist have been installed.

As soon as the railway branch is completed to the mine, permanent camps will be constructed and a plant installed. It is proposed to build roasting furnaces at the mine to treat the ore, which is somewhat sulphurous.

Diamond drilling is being done on the Alice claims one-half mile southeast from the Magpie, and at Iron lake south of White river.

Mr. A. Scott is superintendent, employing 85 men.

III.—TEMISKAMING

A full description of the cobalt-silver mines of the Temiskaming district is given in the fourth edition of Dr. W. G. Miller's Report on the Silver Region of Northern Ontario, which is published as Part II. of the Nineteenth Report. This includes an account of the working mines at Cobalt, South Lorrain, Montreal River and Gowganda. It is, therefore, unnecessary to refer to these mines in this Report.

Porcupine Gold Area

A great deal of interest has been shown during the year in the new gold camp at Porcupine. It is at present the most active camp in Canada. Cobalt has settled down to a steady producer, so that Porcupine, being in the development stage, provides a field for investors and speculators from all over the world. The Dome and Hollinger are the two properties on which any considerable development work was done in 1910. During

the present year, however, a number of other companies have installed plants and commenced underground work. As is usual in a boom camp, a large number of companies have been formed and stock sold to the public on properties on which practically no development work has been done. The Temiskaming and Northern Ontario railway expect to have the branch line from Mileage 224½ on the main line to Porcupine lake completed by July 1st, 1911. The completion of the line will give much-needed access for supplies to the different companies operating there.

The following properties were inspected in April, 1911. Their location can be seen by referring to the map of the Porcupine area accompanying the Report of Mr. A. G. Burrows in Part II. of this volume.

Crown Chartered

On the northeast quarter of the south half of lot 2 in the fifth concession of Tisdale, the Crown Chartered Mining Company have sunk a shaft a depth of 60 feet and cross-cut



Porcupine, Government townsite, March, 1911.

north from the shaft 100 feet. Some trenching has also been done on the claim. The plant consists of a 50-h.p. boiler, 2-drill compressor, hoist and sawmill.

The company also own a claim adjoining the Vipond. During the winter work was begun on this claim and a shaft sunk about 50 feet.

Dobie

On the north half of the south half of lot 1 in the fifth concession of Tisdale, the Dobie Mines, Limited, have sunk a shaft a depth of 100 feet. Some diamond drilling has also been done. These claims were formerly known as the Armstrong-McGibbon.

The plant consists of one 60-h.p. boiler, one 20-h.p. upright boiler, one straight-line compressor and one hoist.

Mr. C. A. Watson is manager.



Dome mine, March, 1911.



Dome, machinery for new mill.

Dome

On the north half of lot 4 in the first concession of Tisdale, the Dome Mines, Limited, energetically carried on underground development work during 1910. Four shafts were sunk to a depth of about 75 feet, 50 feet, 50 feet, and 50 feet respectively. No. 1 shaft and No. 2 shaft, 200 feet west of it, have been connected by a cross-cut at the 40-foot level. Sixty feet east of No. 2 shaft a drift has been run north 75 feet and south 150 feet. A raise was put through to the surface at the end of the south drift. A number of other drifts and cross-cuts were run.

The plant during 1910 consisted of two 60-h.p. boilers, four upright boilers, a 4-drill compressor, four hoists and one Nissen stamp for sampling. During the winter a new power plant was taken in and is being erected. Excavation has been completed for the installation of a 40-stamp mill. This mill was designed and is being erected by the Merrill Metallurgical Company. Preliminary crushing will be done by two gyratory crushers. The ore is then conveyed by belt conveyors to the forty 1,250-pound stamps, crushing to about 8-mesh. It is proposed to adopt a preliminary amalgamation of this product. It then goes to Dorr classifiers, and then to tube mills, followed by a second set of amalgamating plates. The pulp is then led into classifiers, then Dorr thickeners, and then to Pachuco agitating tanks. From the tanks the product is passed through Merrill filter presses. The gold from the solution will be precipitated by the Merrill zinc dust process. It is intended that the mill shall be in operation during the present summer; it is to be motor driven throughout.

Mr. R. M. Meek is manager.

Dome Extension

This property is situated northeast of the Dome and adjoining it.

A small plant was taken in during the early part of 1911, consisting of a boiler, compressor and hoist.

The work is in charge of Capt. Anchor.

Foley-O'Brian

Northeast of the Dome Extension and about one-half mile west of Porcupine lake, the Foley-O'Brian Mining Company have been carrying on development work. A shaft has been sunk a depth of 150 feet and a small boiler and hoist installed. Mr. Mowry Bates is in charge of operations.

A plant consisting of two 50-h.p. boilers and a 5-drill compressor and hoist has been installed.

Hollinger

The Hollinger Gold Mines, Limited, own the four claims consisting of the east half of the north half, and the northeast quarter of the south half of lot 11, and the northwest quarter of the south half of lot 10, in the second concession of the township of Tisdale. Work was started on these claims early in 1910 and has been prosecuted vigorously since that time. No. 1 and No. 3 shafts are 650 feet apart and have been sunk 100 feet. These shafts have been connected by a drift on the vein. A drift has been run north of No. 1 shaft on the vein about 400 feet and south from No. 3 shaft 150 feet. At the north end of the main drift cross-cuts have been driven east and west 100 feet. About 110 feet south of No. 1 shaft a cross-cut has been driven 140 feet to a parallel vein. A cross-cut is also being driven west from No. 3 shaft. At 100 feet north of No. 1 shaft a winze has been sunk 100 feet, and 30 feet of drifting done at that level. It is now proposed to raise a central 4-compartment shaft as a main working shaft.

The plant installed in 1910 consisted of two 60-h.-p. return tubular boilers, 1 6-drill compressor, two hoists, an electric light plant and two Tremaine stamps.

The new plant consists of an electrically driven compressor having a capacity of 1,500 cubic feet of free air per minute, and an electric hoist. A 30-stamp mill is being erected. The cyanide plant will not be installed at present. The treatment at first will consist of crushing the ore by means of jaw crushers, and then by the thirty 1,500-pound



Dome, new power house, dining hall in distance.



Dome, foundation of stamp mill.



Foley-O'Brian Mine, Porcupine.



Foley-O'Brian Mine.

stamps, amalgamating and concentrating. As soon as transportation facilities allow, tube mills and a complete cyanide process will be installed.

The concentrating will be accomplished by Overstrom tables and Frue vanners. The mill will be erected about 200 feet west of No. 1 shaft.

Camp buildings have been erected for the accommodation of 250 men. All the machinery at the mill will be driven by electricity delivered by the Porcupine Power Company.

Mr. P. A. Robbins is general manager.

Porcupine Power Company

At Sandy Falls on the Mattagami river, about six miles northwest of the Hollinger, the above company are constructing a hydro-electric power plant for the supplying of electric power for use at the mines at Porcupine.

A timber dam about 800 feet long has been built across the river. This will raise the water about 13 feet and will give an effective head of water of 34 feet. Water is



Surface plant of Hollinger mine, April, 1911.
(Destroyed by fire, May 1911).

led from the intake at the dam to the power house by a flume 16 feet by 16 feet. The present installation will consist of two units, each unit comprising a pair of twin water-wheels directly connected with a 3-phase, 25 cycle, 1,250-kilowatt generator. The power will be transmitted to the mines at a pressure of 12,500 volts. The transmission line will consist of two independent 3-phase circuits of aluminium conductors carried upon a single line of poles.

The power house is a frame structure covered with galvanized iron. The superintendent in charge of construction, Mr. H. D. Symmes, expects to be delivering power in June, 1911.

Northern Ontario Exploration Company

This company was formed by Bewick, Moreing and Company to take over fifty claims from the Timmins-McMartin-Dunlap syndicate, agreeing to provide a working capital of half a million dollars for developing the claims. These claims are situated chiefly in the townships of Tisdale, Whitney and Deloro. The company have constructed four camps, and sufficient supplies have been brought in for the employment of 150 men during the summer. A headquarters camp has been established near Pearl lake.



Dam of Porcupine Power Company, looking up stream.



Dam of Porcupine Power Company, looking down stream.

Pearl Lake

The Pearl Lake Gold Mining Company have begun work on claims just east of Gillies lake. A small plant has been installed and two shafts started.

Preston East Dome

This property lies to the southeast of the Dome and adjoining it. Camps were erected and a plant brought in during the winter. Practically no mining had been done on the property.

Mr. S. Thorne is in charge of operations.

Rea

The Rea Consolidated Mines, Limited, are working on the south half of lots 5 and 6, in the fourth concession of Tisdale. A shaft has been sunk a depth of 200 feet, and on the 100-foot level a cross-cut driven 20 feet north and south. Another shaft about 150 feet west on the same vein has been sunk to a depth of 60 feet.

A plant consisting of two 60-h.p. boilers, a 6-drill compressor and hoist has been installed.

Mr. Kingsmill is in charge of operations.

Scottish Ontario

On the southeast quarter of the south half of lot 11, in the fifth concession of Whitney, the Scottish Ontario Gold Mining Company have sunk a shaft a depth of 90 feet. A cross-cut has been driven from the shaft south 20 feet and north 100 feet. In the north cross-cut the vein was cut and 50 feet of drifting done on it. A 20-h.p. boiler and hoist have been installed.

Mr. Peter Maclaren is manager.

Standard

About two miles south of Porcupine lake in the northern part of Deloro, the Standard Silver Mines, Limited, have sunk a shaft a depth of 50 feet. A 20-h.p. boiler and hoist have been installed.

Mr. L. P. Silver is in charge of operations.

West Dome

On the Hotchkiss claims adjoining the Dome on the west, the West Dome Mines, Limited, are sinking a shaft. This shaft was about 25 feet in depth. A power plant consisting of two 60-h.p. boilers, a 6-drill compressor and hoist has been installed. Several holes have been put down with a shot drill to test the veins at depth.

Mr. R. A. Weiss is superintendent in charge.

Vipond

On the southeast quarter of the south half of lot 10 in the second concession and the northeast quarter of the north half of lot 10 in the first concession of Tisdale, southeast of the Hollinger, the Porcupine Gold Mines, Limited, have sunk a shaft a depth of 100 feet. A cross-cut was driven 50 feet east to the vein and drifts run on this vein 60 feet north and south from the cross-cut. On another vein a shaft was sunk 40 feet.

The plant consists of a 40-h.p. boiler, a small compressor and hoist. A Nissen stamp was put in operation about the first of the year.

Mr. C. H. Poirer is superintendent.

Swastika Area

Swastika Gold Mine

The Swastika Gold Mining Company hold nine claims near Swastika station, Temiskaming and Northern Ontario railway. The three original claims are situated on the shore of Otto lake, two adjoining on the south in Otto township, two to the north in unsurveyed territory, and two in lot 9 in the fourth concession of Otto.



Rea Mine.



Scottish Ontario Mine.

The main shaft has been sunk 100 feet below the adit level. The adit level is at a depth of 40 feet, and some 400 feet of drifting has been done on this level. On the 100-foot level considerable drifting and cross-cutting have been done. From this level a winze has been sunk on the vein a depth of 90 feet. In all over 1,000 feet of development work has been done.

The plant consists of a 60-h.p. boiler, compressor and hoist. A 5-stamp mill has been erected and is being run steadily.

Mr. A. T. Bell, of Tavistock, is president of the company, and Mr. J. W. Vandergrift superintendent, employing a force of 32 men.

Munro Township

On a number of properties in the townships of Munro and Guibord, mining work was carried on for gold during 1910. The only property on which anything was being done in April, 1911, was the Detroit and New Ontario.

Detroit and New Ontario

On this property a shaft has been sunk a depth of 80 feet. The plant consists of two 50-h.p. boilers, 6-drill compressor and hoist. Mr. G. M. Morin was in charge, employing 11 men.

American Eagle

On this property no work has been done in 1911. One shaft has been sunk 30 feet and some surface prospecting done. The plant consists of two 50-h.p. boilers.

Gold Pyramid

On this property, situated in Munro, a shaft has been sunk 25 feet, but no work done in 1911. The plant consists of two 50-h.p. boilers.

Munro

The Munro Mining Company ceased work in August, 1910. A shaft had then been sunk 90 feet. A 30-h.p. boiler and hoist were used in doing this work.

Temagami Area

Very little mining was carried on in this area in 1910. The Northland pyrites mine was in operation the first part of the year, but work was stopped in July and has not since been resumed. The work done, other than that described in the last Report, consisted of stoping between the second and third levels.

Larder Lake Area

An inspection of this area was made in August, 1910, by Inspector Robinson. He found very little mining work in progress. The Gold Fields, Limited, generally known as the Harris-Maxwell, were engaged sinking a shaft on the top of the hill above the lake. This shaft was 25 feet in depth and the equipment used was boiler, hoist and derrick.

Mr. B. T. Brooks was in charge of operations, employing 11 men.

No mining work was being done at the property owned by the Victoria Creek Gold Mines, Limited, but it was pumped out and open for examination. It was found that a shaft had been sunk a depth of 150 feet and 360 feet of drifting done at the 100-foot level.

The plant consists of a 50-h.p. boiler, a 2-drill compressor and hoist.

Mr. W. T. Mason, of Montreal, is president, and Mr. G. Eggleston superintendent.

On a number of other properties small gangs were engaged in doing assessment work.



Swastika Mine.



Detroit camp, Munro township.

Canadian Exploration Company

This company worked continuously during the year at the Long Lake mine in township 69, about nine miles south of Naughton. A mill was erected and was in operation part of the year. At the mill the ore is crushed in a 10-stamp mill and re-ground in a tube mill. The pulp is then subjected to cyanide treatment without preliminary amalgamation.

The first level of the mine is at a depth of 76 feet. From the shaft a cross-cut has been driven east 90 feet and a main drift run north and south on the ore body, a total length of 230 feet. From this main drift cross-cuts have been driven at intervals and short drifts to connect the cross-cuts. Four raises have been put up and a winze sunk from this level.

Mr. R. W. Brigstocke is manager.

IV.—EASTERN ONTARIO

Eastern Ontario continues to produce a variety of minerals. The mining of gold was at a very low ebb in 1910. The old Belmont mine has recently been purchased by new interests, and it is expected work will be resumed in 1911. The minerals produced in this area productive of largest returns are corundum, iron pyrites, mica, graphite, feldspar and talc. In addition to these, marble, building stone and limestone for cement purposes created large industries in the respective centres in which they were being raised.

Eastern Ontario feldspar holds a very prominent place in the United States market. This feldspar is practically all shipped in its crude state to Trenton, N.J., and East Liverpool, Ohio, where it brings as high a price as any spar on the market. A sample of ground spar from the Richardson quarry, taken from the bins at the mill of the Eureka Flint and Spar Company, Trenton, N.J., gave the following analysis:[1]

	Richardson spar.	Pure spar (theoretical).
Silica (SiO_2)	65.87	64.7
Alumina (Al_2O_3)	19.10	18.4
Lime (CaO)	.20	
Potash (K_2O)	12.24	16.9
Soda (Na_2O)	2.56	
Water (H_2O)	.64	
Total	100.61	100.00

The prices of feldspar in general are as follows at Trenton, N.J., f.o.b. mills:—

	Crude, per long ton.	Ground, per short ton.
No. 1 Canadian	$5.50	$10.50
No. 2 or "Standard"	$5.00-$5.25	$9.00-$9.50

Feldspar is extensively used by the manufacturers of pottery, enamel ware, enamel brick and electrical wares. The trade demand that for these purposes the spar shall be practically free from iron-bearing minerals such as biotite, hornblende, iron pyrites, etc. The No. 3 spar, having an approximate analysis of 76 per cent. silica, 13 per cent. alumina, 5.5 per cent. potash and 3.5 per cent. soda, is used for poultry grit and roofing purposes. The price of this material in northern New York state, ground, is from $3.00 to $3.50 per ton. There is no production of this grade in Ontario. There is no mill for grinding feldspar in Ontario, and it is all shipped in its crude state as taken from the

[1]Bulletin No. 420, U.S. Geol. Survey.

mines. The states of Connecticut, Pennsylvania and Maryland are the principal producers of feldspar in the United States. Ontario feldspar is, however, handicapped by the long rail haul to Trenton and East Liverpool. The establishment of some branches of the pottery and enamel ware industries in Ontario, where we have all the raw material necessary, should be looked upon as a possibility in the near future.

As with feldspar, most of the mica produced in Ontario is shipped to the United States. Up to the present time the crude mica has been cleaned and thin-split here, furnishing employment to 1,000 or 1,500 people.

Small quantities of apatite continue to be produced from mines worked for mica. The outlook for better prices for this mineral is, however, not very assuring in view of the large beds of phosphate discovered in Utah, Wyoming and Idaho, and the considerable production from Florida.

The ground talc industry at Madoc has been steadily growing, the production being nearly double in 1910 that of 1909. There was also a marked increase in the production of graphite.

Electric power is largely used at the mines and quarries of eastern Ontario. The Seymour Power and Electric Company are supplying a number of producers both at the mines and quarries. The Lehigh plant of the Canada Cement Company near Belleville is using about 3,000 h.p. furnished by this company and the Point Anne Quarries, Limited, about 300 h.p.

About 2 miles south of Bancroft the Ontario Marble Quarries, Limited, are opening up a marble quarry.

Iron Ore

The Mayo mine, operated by the Canada Iron Corporation under lease from the Mineral Range Iron Mining Company at Bessemer, was closed in May, 1910, and no work has since been done at it.

The old Wilbur mine near Lavant on the Kingston and Pembroke railway was re-opened after having been closed down for about two years.

About one mile northeast of Madoc, Mr. G. A. Longnecker was engaged in developing an iron claim. Considerable trenching and testpitting was done and a shaft sunk 35 feet. A diamond drill was also in operation.

Wilbur

This mine is being operated by the Exploration Syndicate of Ontario. No. 1 shaft worked by the last operators has been re-opened, as also an old shaft northwest of No. 1. At No. 1 the depth remains the same, the work consisting of stoping on the different levels that have not been worked out and running exploratory drifts on the lower levels. At the other shaft, which is about 80 feet deep vertically, the work of re-timbering was about to begin. This shaft had not been worked for about 20 years, so that it was necessary to re-timber all the workings.

A new crusher and ore bins have been erected at No. 1 shaft. The present plant consists of three 80-h.p. boilers, two compressors, both straight line, engines and crushers. This plant is to be supplemented by a new plant at No. 2 shaft consisting of boilers, compressor and hoist. New camp buildings have been built.

Mr. J. G. McNulty is in charge, employing 100 men.

Iron Pyrites

Sulphide

Considerable change and improvements have been made at this mine during the year. The new shaft mentioned in the last Report has been completed. This shaft is situated about 300 feet east of the old shaft and extends to the fifth level, the

lowest level of the mine. As the old shaft extended only to the third level, the work while the new shaft was being completed was all above this level, and consisted chiefly of stoping on the second and third levels north vein. A head frame has been erected over the new shaft containing a sorting and breaking floor and ore pockets. An electric hoist has also been installed at this shaft. The motive power at the mine and works is now all electric, obtained from the Seymour Power and Electric Company.

The building for the manufacture of hydrochloric acid has been completed and all the machinery installed. Machinery has also been installed for doubling the capacity of the other parts of the acid plants.

Mr. W. H. DuBlois is superintendent in charge for the owners, the Nichols Chemical Company.

Craig

At the Craig property just west of Sulphide, the shaft is now at a depth of 250 feet with levels at 100 feet and 200 feet. On the first level, drifts have been run east and west 80 feet and 85 feet respectively, and stoping has been begun in each.

On the second level, the east drift is in 75 feet from the shaft, and the west drift 25 feet. The ore taken out is being sold to the Nichols Chemical Company at Sulphide.

The plant consists of two upright boilers, a straight line compressor and hoist.

Queensboro

On the northeast quarter of lot 9 in the tenth concession of Madoc, the property formerly worked by the Canadian Pyrites Syndicate, the Canadian Sulphur Ore Company are developing an iron pyrites property. The shaft is 75 feet in depth, with short drifts on the ore and some stoping done. Two other shafts have also been sunk to a depth of 75 feet and 50 feet.

The plant consists of an 80-h.p. boiler, a 4-drill compressor and hoist.

Mr. S. N. Graham is superintendent.

About one-half mile from this property Mr. M. J. O'Brien is also developing a deposit of iron pyrites. Several tests pits have been sunk.

Zinc Ore

Olden

This was the only zinc mine in operation in Ontario in 1910. Work was confined altogether to the pit on the new vein northwest of the old workings. This pit is now 50 feet in depth and about 75 feet in length.

The mine is owned and operated by Messrs. Richardson of Kingston, and was closed down late in 1910.

Feldspar

Richardson Mine

The Kingston Feldspar and Mining Company shipped steadily during the season of navigation. This mine is the largest shipper of feldspar in either Canada or the United States. It is worked as a large open pit, the dimensions of the workings being about 500 feet in length, 200 feet in width and 130 feet in depth measured from the highest point of the wall. Hoisting is done by means of a cableway across the widest part of the pit and by a derrick at the northwesterly end. At the central part of the pit, quartz occurs as a capping over the feldspar. Work at removing this quartz was in progress during the winter. It is shipped to Welland, where it is used in the manufacture of ferro-silicon. It was also proposed to take off the capping of gneiss that occurs on the north side of the pit for a distance of 20 to 25 feet. This capping is from 10 to 20 feet in thickness, with good feldspar under it. It was also intended to enlarge the scows used for hauling the feldspar across the lake to Glendower siding, so that the output for 1911 could be increased.

The company shipped some feldspar from the Card mine 2 miles west of Verona, but no mining was done here during the latter part of the year.

Mr. M. J. Flynn is superintendent, employing about 40 men.

McDonald Mine

The McDonald Feldspar Mining Company shipped steadily during the year from their properties on lots 4 and 5 in the tenth concession of Portland. Both feldspar and quartz were shipped. The feldspar is obtained chiefly from lot 4 where it is mined by open cut work, the open cut being 350 feet long and 50 feet deep. On lot 5 several smaller pits have been worked.

Mr. D. A. Brebner is managing director, and Mr. T. A. Gamey superintendent.

Talc

At the Henderson talc mine near Madoc operations were carried on continuously throughout the year under the direction of Mr. S. Wellington, who operates the mine under lease.

The main shaft has been sunk a depth of 175 feet, and on the 75-foot level a drift runs west 75 feet.

During the summer talc was mined by open-cut work east of the old open cut. The greater part of the talc mined is hauled by wagon to the talc mine at the railway station at Madoc, where it is ground for the trade. About 1,000 tons were shipped in the crude condition to the United States.

The talc mill operated by Geo. H. Gillespie and Company at Madoc station buys raw material from the above mine. Improvements were made at the mill during the year enabling the company to handle a larger tonnage. The ground talc is graded according to the requirements of the trade.

Electric power obtained from the Seymour Power and Electric Company is used for driving the machinery.

Fluorspar

Messrs. Gillespie and Wellington opened up a deposit of fluorspar during the year in the township of Huntingdon on the shore of Moira lake about 2 miles southwest of Madoc. The fluorspar was mined from an open cut 30 feet long and 25 feet deep.

Mica

The condition of the mica industry in eastern Ontario was about the same in 1910 as in 1909. With the exception of a couple of mines, the production comes chiefly from prospects that are intermittently worked. In no place in Ontario has the economic working of the deposits of mica been carried to a greater depth than about 200 feet; in fact, most of the mineral is excavated from above the 100-foot level. As a result, expensive plants are unnecessary. A horse whim and derrick constitute in a number of cases the surface plant. This equipment can easily be moved from pit to pit as the pockets are mined out. On some properties a large number of these shallow workings are found, nearly all of which have been producers.

Lacey

This mine, worked by the Loughborough Mining Company, has been the largest producer of amber mica in Ontario, and as yet is unsurpassed.

During the summer the mining work was confined wholly to the open pit, which is now 75 feet in depth. During the winter mining is carried on underground, chiefly in the parallel body south of the main workings. Here the drift has been run on the deposit for 200 feet in length and a stope carried 35 feet in height. The upper part of the main shaft has been re-timbered.

Mr. G. W. McNaughton is manager.

Other Mica Properties

On lot 1 in the eleventh concession of Loughborough, Mr. H. Richardson has been mining mica during the year. Three pits have been sunk to a depth of 45, 60 and 35 feet. On the deepest shaft, drifts have been run on the vein about 20 feet on each side of the shaft.

Mr. Richardson also did some prospecting for mica at the Baby mine, township of Burgess.

On the north part of lot 6 in the eighth concession of Loughborough, Messrs. Scriven and Whyte worked for part of the year. A shaft was sunk 50 feet, and some drifting done. On the lot adjoining the east of the above lot a pit was also sunk prospecting for mica.

Messrs. Stoness and Kent worked their mica property at Bob's lake for the greater part of the year. Several pits have been sunk on this property to a depth of 25 to 50 feet.

The Silver Queen property, on lot 13 in the fifth concession of Burgess, was opened in November by Mr. Edward Smith. He had been compelled to close operations the first part of the year owing to legal difficulties concerning the title. These were cleared away, and work is now proceeding at the property. The main workings remain unchanged. Another pit about 30 feet deep was, however, opened and some stoping done.

Mr. Rinaldo McConnell, Kent Bros., of Kingston, and Mr. J. A. Stewart, of Perth, were prospecting lots on the northwest side of Otty lake during part of the year.

Mica Trimming Works

The following firms are engaged in trimming and thin-splitting mica in Ottawa:—General Electric Company; Laurentide Mica Company; Eugene Munsell & Company; Wallingford Mining and Mica Company; Mr. R. Blackburn; Mr. S. O. Filion; Mr. N. Holland; and in Kingston, Kent Bros. and Messrs. Richardson.

Graphite

The production of graphite is on the increase in Ontario. Three properties are now engaged in mining and refining graphite.

Black Donald Mine

At this mine, operated by the Black Donald Graphite Company near Whitefish lake, mining work is carried on during the summer months, producing sufficient crude material to keep the mill in operation the entire year. The condition of the underground workings is about the same as described in the last Report, with the exception that the stope has been extended further under the lake at the north end.

The system of concentration at the mill remains unchanged. Owing to the difficulties which attend the refining of graphite, the process is held as a trade secret.

Electric power is used both at the mine and the mill.

Mr. R. F. Bunting is manager, and Mr. Geo. W. Stewart superintendent.

McConnell Mine

Both the mine and mill of the Globe Refining Company near Port Elmsley were in operation the greater part of the year. At the mine, situated three miles from the mill, the shaft remains the same depth, but the stopes have been carried east and west from the shaft. In the stope east of the shaft, stulls have been put in and heavily lagged to support the roof.

Further changes have been made in the refining of the graphite at the mill.

Mr. C. Meech is superintendent of both mine and mill, employing 10 men at the mine and 12 at the mill.

Wilberforce Prospect

At Wilberforce, about 20 miles west of Bancroft on the Irondale, Bancroft and Ottawa railway, a large mill for the concentrating and refining of graphite is in course of erection. Very little mining work has yet been done at the mine, which is situated a short distance from Wilberforce. Mr. W. M. Matthews, of Toronto, is in charge of the operation.

Corundum

The Manufacturers Corundum Company are now operating under lease the mines and mills of the Canada Corundum Company and the Ashland Emery and Corundum Company. They are also working the Armstrong property. All the corundum is mined by open-cut methods, on account of the limited depth to which it has so far been found to occur. Corundum has been taken from the hill at the Craig mine over a surface area of 25 to 40 acres. This hill is still furnishing most of the ore for the mill. Some ore is also being obtained from the workings known as the Klondike on the west end of the hill.

The mill at the Craig and the Ashland have been fully described in former reports of the Bureau.

Mr. D. A. Brebner is managing director, and about 200 men are employed by the company.

Silver Refineries

Deloro

The Deloro Mining and Reduction Company have works at Deloro, 2 miles east of Marmora station, Central Ontario railway, for refining the silver-cobalt ores from the Cobalt area. At these works silver and arsenic are produced in their refined state, and cobalt and nickel in the form of oxides.

Electric power is used entirely at the works, and is obtained from the Seymour Power and Electric Company.

Mr. S. B. Wright is manager.

Swansea

At Swansea, Ontario, the Swansea Smelting and Refining Company have begun the refining of silver-cobalt ores. The plant was put in operation in 1910, and is situated about one-half mile north of Swansea station, Grand Trunk railway.

Mr. F. B. Allan is president, and Mr. B. E. Hoffman manager.

Marble

The Ontario Marble Quarries, Limited, are quarrying marble on lots 28 and 29 in the tenth concession of Dungannon, and on lot 41, West Hastings road, being about two miles south of Bancroft and one-half mile from the Central Ontario railway.

No. 1. quarry on lots 28 and 29 has an excavation 60 feet long, 60 feet wide and 20 feet deep. A 20-ton steel derrick has been erected and a channeler put in use for quarrying the marble. The blocks taken out are about 6 feet by 5 feet by 5 feet. These blocks are picked up by means of the derrick and placed on tram cars, and then taken directly, without further handling, into the mill for sawing.

No. 2 quarry is situated on lot 41, about one-half mile west of No. 1. An area 100 feet wide by 75 feet long has been stripped, and three machine drills are at work blocking out the marble in blocks 5 feet by 5 feet by 6 feet. A large derrick has been erected here for handling the blocks of marble.

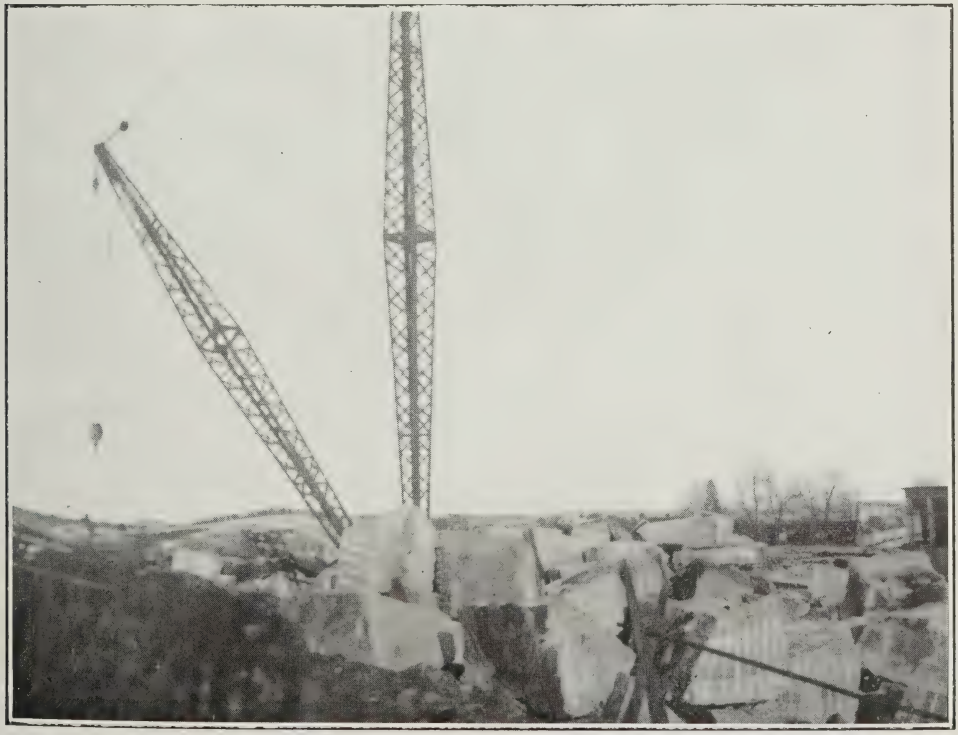
Adjoining No. 1 quarry is located the works in which the marble is sawed into slabs. This plant consists of one 90-h.p. boiler, one engine and two gang saws. Each of these gang saws contains 37 blades placed so as to saw slabs about 1 inch in thickness. The marble in this form is shipped to Toronto, where it is polished and cut to sizes according to the requirements of the trade.

The marble grades from a white to grey in the No. 1 quarry. At No. 2 quarry it is found in a variety of colours, consisting of pink, greenish, mottled and brecciated.

Mr. T. Morrison is superintendent, employing 65 men.



Ontario Marble Quarry No. 1.



Ontario Marble Quarry No. 2.

Lanark Quarry

Near the town of Lanark a marble quarry has been worked for some time. The marble is shipped during the winter by team to Lavant station, Kingston and Pembroke railway.

Limestone Quarries

Lehigh

At the Lehigh plant of the Canada Cement Company, at Point Anne, 6 miles from Belleville, limestone is being quarried for use in the manufacture of cement. This



Ontario Marble Quarries, near Bancroft, showing block of marble.

limestone is of Trenton formation, and, being low in magnesia, makes an excellent rock for the manufacture of cement. It is also a good building stone. A sample[2] of this rock shows the following composition: silica 1.64, ferric oxide .53, alumina .21, lime, 54.06, magnesia .55, carbon dioxide 42.90, sulphur trioxide 0.4.

The quarry is now about 30 feet deep, 500 feet long and 350 feet wide. After the rock is broken it is loaded into 5-ton cars by means of a steam shovel. This rock is then hoisted into the mill, where it is crushed in large gyratory crushers, passing through a series of these until it is reduced to the proper fineness. An electric hoist is used to hoist the rock into the mill.

Mr. T. McGinnis is superintendent of the quarry and mill.

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[2]B.M., Vol. 13, Part ii., page 61.

Point Anne

At Point Anne, about one-half mile from the Lehigh Cement plant, the Point Anne Quarries, Limited, are quarrying limestone and crushing it for use in concrete work. The quarry is very shallow as yet, there being a bank about 12 feet in height from which the rock is blasted. It is then loaded on cars by a steam shovel and taken to the crushing plant located at the dock, where it is crushed and graded. It is then taken by belt conveyor to storage bins, from which it is loaded into boats. The quarry is only operated during the season of navigation. The machinery is now driven by electric power obtained from the Seymour Power and Electric Company.

Mr. W. M. Greig is superintendent.

Gloucester

H. Robillard and Sons are operating a limestone quarry in Gloucester township, about three miles from Cummings Bridge on the Montreal road. These quarries are in Trenton limestone, very high in lime and low in magnesia. About 25 men are employed at the quarry during the summer.

Burnt River

Britnell and Company, of Toronto, are operating a quarry about three-quarters of a mile south of Burnt River station, in the township of Somerville. This limestone is of Black River age and occurs in a ledge 40 to 50 feet in height. The large blocks are used for building stone, and the refuse crushed and shipped to Toronto for use in concrete work. About 30 men are employed.

V.—SOUTHWESTERN ONTARIO

This area, comprising all that part of Ontario south of a line drawn from Toronto to Key Harbor on Georgian Bay, has been known chiefly as productive of oil, gas and salt. Other important mineral industries are now coming into prominence. Some of them derive their raw material from other parts of the Province, such as the Coniagas Reduction Company at Thorold, and the blast furnaces at Hamilton and Midland.

The mining of gypsum in the valley of the Grand river has for many years been of importance. It is now occupying greater attention due to the construction of larger plants for crushing, calcining and manufacturing alabastine, wall plaster, etc.

The quarries in this part of Ontario are also of great importance. Stone is quarried for building purposes, cement manufacture, making of lime, and, when crushed, for concrete work.

Canada Refining and Smelting Company

The works of the Canada Refining and Smelting Company are located at Orillia and commenced the treatment of cobalt-silver ores in April, 1911, with a capacity of about 10 tons of ore per 24 hours. The company produce refined silver, and, with the completion of their larger plant, will also make refined white arsenic (As_2O_3), and cobalt and nickel oxides or hydrates. The company secure power for driving their machinery from the town of Orillia, which contracts to sell electric power to manufacturers at $16.00 per h.p. per year. Nothing but high grade ore has as yet been bought by the company. Mr. W. F. Almy, Orillia, is manager.

Coniagas Reduction Company

The works of the Coniagas Reduction Company, the capital stock of which is owned by the Coniagas Mines, Limited, are located at Thorold. This company buys silver-cobalt ore not only from the Coniagas mine, but also from other mines in the camp.

The capacity of the works has been enlarged and the plant for making cobalt and nickel oxide completed. Refined silver and arsenic are produced; also the oxides of cobalt and nickel.

Mr. R. L. Peek is superintendent.

Blast Furnaces

Hamilton

The Hamilton Steel and Iron Company was taken over by the Steel Company of Canada, Limited, which is an amalgamation of the above company with the following: Canada Bolt and Nut Company, Canada Screw Company, Dominion Wire Manufacturing Company and the Montreal Rolling Mills Company. The head office is in Hamilton, Mr. R. Hobson being president and Mr. H. H. Champ, treasurer.

The company have two furnaces in blast, producing about 500 tons of pig iron per 24 hours. The greater part of the raw ore is obtained from mines in Minnesota. One of the furnaces is of modern type of construction and the other is of the old type of hand-filled furnaces. The company also have an open hearth plant a short distance from the blast furnace.

Midland

The Canada Iron Corporation completed the construction of their new furnace at Midland in August, 1910, and it has since been in operation. The old furnace was in blast up to that time. It is the purpose of the company to rebuild the old furnace. The new furnace is of Roberts design, and has a capacity of 300 tons of pig iron per day. Additions are also to be made to the blowers to make them adequate for the new furnace.

Mr. A. C. Adams is superintendent, employing 150 men.

Gypsum

The production of gypsum in Ontario, according to the Report of the Royal Commission to investigate the Mineral Resources of Ontario, 1890, began about 1864, and since that time there has been a steady production. The gypsum beds are found in the Onondaga formation in the valley of the Grand river in the counties of Brant and Haldimand. Two qualities of gypsum are mined, the white and the gray. The white gypsum is quite pure, and is used in the manufacture of alabastine, stucco and for ornamental work. The gray variety, which has the largest production, is used in cement making to regulate the setting, and as a fertilizer. The beds of white gypsum are found generally with a thickness of three to four feet. Overlying the beds are layers of dolomite shales and limestone, in all from 4 to 6 feet in thickness. These are covered by 40 to 50 feet of post-glacial drift. The beds of gray gypsum have a thickness of 6 to 9 feet, and overlying these are 25 to 40 feet of layers of dolomitic limestone and shales. These also have a covering of post-glacial drift from 40 to 50 feet thick.

It is necessary to call attention to the kind of incline shafts that have been sunk in this area. These shafts are as a rule only constructed wide enough to permit of the passage of a car. Little attention has been paid to the requirements of the Mining Act, which provide for a separate travelling way for the workmen in all shafts. When power hoists are used, the danger from workmen being caught by the cars is made much greater. There is also the danger of cars breaking away and running uncontrolled down the shaft. In future, workmen must not be allowed to travel in these incline shafts while hoisting is in progress; and any new shafts constructed must be in accordance with the requirements of the Mining Act.

The Alabastine Company

This company are working a gypsum mine situated three-eighths of a mile north of the town of Caledonia. An incline shaft about 800 feet in length has been sunk to the beds of gypsum. This has a vertical depth of about 80 feet. Before machinery was installed, a horse was used to haul the cars of gypsum up the incline shaft. The bed of gypsum being worked is 7 to 8 feet in thickness and lies horizontally. It is mined by the room-and-pillar method. At present the underground workings on the lower seam extend over one acre in area.

An electric driven drill is used for boring holes for breaking down the gypsum, a 10-foot hole being bored in 5 to 10 minutes.

A mill for crushing, grinding and calcining the gypsum has been erected near the mouth of the incline shaft. The incline skipway leads directly into the mill, where the cars dump into bins from which the gypsum is fed into crushers and then, by continuous process, passed through finer crushers to the calciners, then through pulverizers to the storage rooms for shipment. A spur from the Grand Trunk railway has been built to the mill.

Natural gas is used in gas engines for generating power to drive the mill, and for generating electricity for use underground.

Instructions were given with regard to sinking a new shaft, handling of explosives, etc.

Mr. H. J. Haire is superintendent, employing about 40 men in the mine and mill.

Carson Mine

The Alabastine Company are also operating a property about 3 miles south of Caledonia for white gypsum. The incline shaft is about 500 feet in length. The workings extend over an area of about 300 feet long by 200 feet wide. The waste rock is used for filling for pillars. An air shaft 75 feet in depth has been sunk to the workings. The bed here is about four feet in thickness. A horse is used for hauling the loaded cars up the incline shaft.

Caledonia Gypsum Company

This company are operating a gypsum mine one-half mile west of Caledonia. An incline shaft 260 feet in length has been put down to the bed of gypsum, connecting with a vertical shaft 72 feet in depth. Stoping on the deposit has just started. Another vertical shaft has been sunk 70 feet, 200 feet south of the vertical shaft. A mill has also been erected for crushing the gypsum.

The plant consists of two gas engines, a crusher, an electric generator and an electric hoist.

A spur has been built from the Grand Trunk Railway to the mill.

Mr. E. J. Hunter, of Hamilton, is managing director.

Crown Gypsum Company

One-half mile from York on the south side of the Grand river in Oneida township, the Crown Gypsum Company are operating a property which has been described in former Reports of the Bureau of Mines as the Martindale mine. The report of the Inspector of Mines for 1896 states that an area from 25 to 30 acres had been mined out.

A new incline shaft 500 feet in length has been sunk from the west side of the deposit and connected with the old workings. The gypsum bed is about four feet in thickness. It is mined by the room-and-pillar method, the waste rock being left underground and built up as pillars to support the roof. At various places in the gypsum bed are found large cavities from which the gypsum has been dissolved out. The rock covering the gypsum bed is only from 4 to 6 feet in thickness, and on the edge of the deposit where the gypsum ends, the rock covering has been eroded, and the workings run into post-glacial drift. The bed of gypsum terminates on all sides in this manner.

The power plant consists of a 90-h.p. boiler, compressor and engine for operating the hoist. A narrow gauge railway has been built from the mine to Lythmore station, Michigan Central railway, where the mill for grinding the gypsum is located.

Instructions were given regarding the use of explosives and working on the incline shaft.

Mr. J. A. Nelles is superintendent.

Limestone Quarries

Brown Quarry

The Messrs. Walker Bros., of Merritton, are working a quarry in the township of Stamford, 2 miles east of Thorold.

The rock quarried is limestone, which is used for curbstones, bridge works, window sills, etc.

The firm has a mill at Merritton where the stone is sawed for the various uses.

Hagersville Quarry

The Hagersville Contracting Company are operating a quarry on lot 14 in the thirteenth concession of Walpole township, county of Haldimand. The product is used as a flux by the St. Thomas Car-Wheel Works, as road material, and for concrete work.

Mr. D. C. Ingals is manager, employing about 60 men during the summer months.

Canada Iron Corporation

On the north half of lot 19 in the fifth concession of Tay township, county of Simcoe, the Canada Iron Corporation are quarrying limestone for use as a flux at their blast furnaces. The quarry is situated on the shore of the bay and the stone is hauled by boat to their ore dock at the blast furnace.

Anderdon Quarries

In the township of Anderdon, county of Essex, the Amherstburg Quarry Company are operating a quarry of limestone. This limestone is of Corniferous age and carries beds high in magnesium. The quarry has been worked for some years and is of considerable extent. The company employ 60 to 70 men.

Sherkston Quarries

The quarries of the Empire Limestone Company, at Sherkston, county of Welland, have the largest production of any quarry in the Province. This company employ 200 men.

The limestone is of Corniferous age, and differs from rock of the same age in Essex county in being low in magnesium. It is unusually pure, and is therefore an ideal rock for the manufacture of calcium carbide, in which it is extensively used. It is also shipped to the iron and steel plants at Buffalo and Hamilton, where it is used as a flux.

Natural gas being found in quantities near, it is utilized as a fuel for making lime out of this rock.

There are a large number of other quarries in this part of Ontario where the limestone is quarried and used for building purposes, road material, concrete work, making lime, etc., that were not inspected during the year.

SILVER IN THUNDER BAY DISTRICT

BY N. L. BOWEN

During the summer of 1910 the writer, assisted by Mr. A. F. Mahaffy, was occupied in the examination of the silver-bearing area in the Thunder Bay District of Ontario. The more detailed work was confined to the townships of Strange, Lybster, Gillies, and Scoble, but trips were made to other interesting parts of the area to see prospects and clear up relationships.

The Thunder Bay District extends from Lake Superior to the northern boundaries of the Province, and takes its name from the embayment on the north shore of the lake which contains the two harbors, Port Arthur and Fort William, the head of lake navigation.

Silver has been mined on the shores of Thunder Bay and in the area tributary thereto for some years. The history of the region is long and varied. As early as 1846 a small quantity of copper-silver ore was mined at Spar Island, about 24 miles south of Port Arthur. Little work was done, however, and it was not until the discovery of the Thunder Bay vein (1866), Shuniah vein (1867), and Silver Islet vein (1868), that extensive mining was begun. Within a few years the famous Silver Islet vein had produced about three and a quarter millions of dollars. The production of the other properties was small, and toward 1880 the total output of the district had fallen off to an insignificant amount.

It was the discovery of the Rabbit Mountain vein in 1882 which led to further prospecting, with the result that numerous rich veins were found along the southern edge of the Whitefish valley, southwest from Port Arthur. Mining flourished until 1892, when the price of silver fell and work was discontinued at all the properties. Again in 1898 the West End mine was re-opened and operated continuously until 1903. The little work that has been done in the district since 1903 has been of the nature of prospecting and testing.

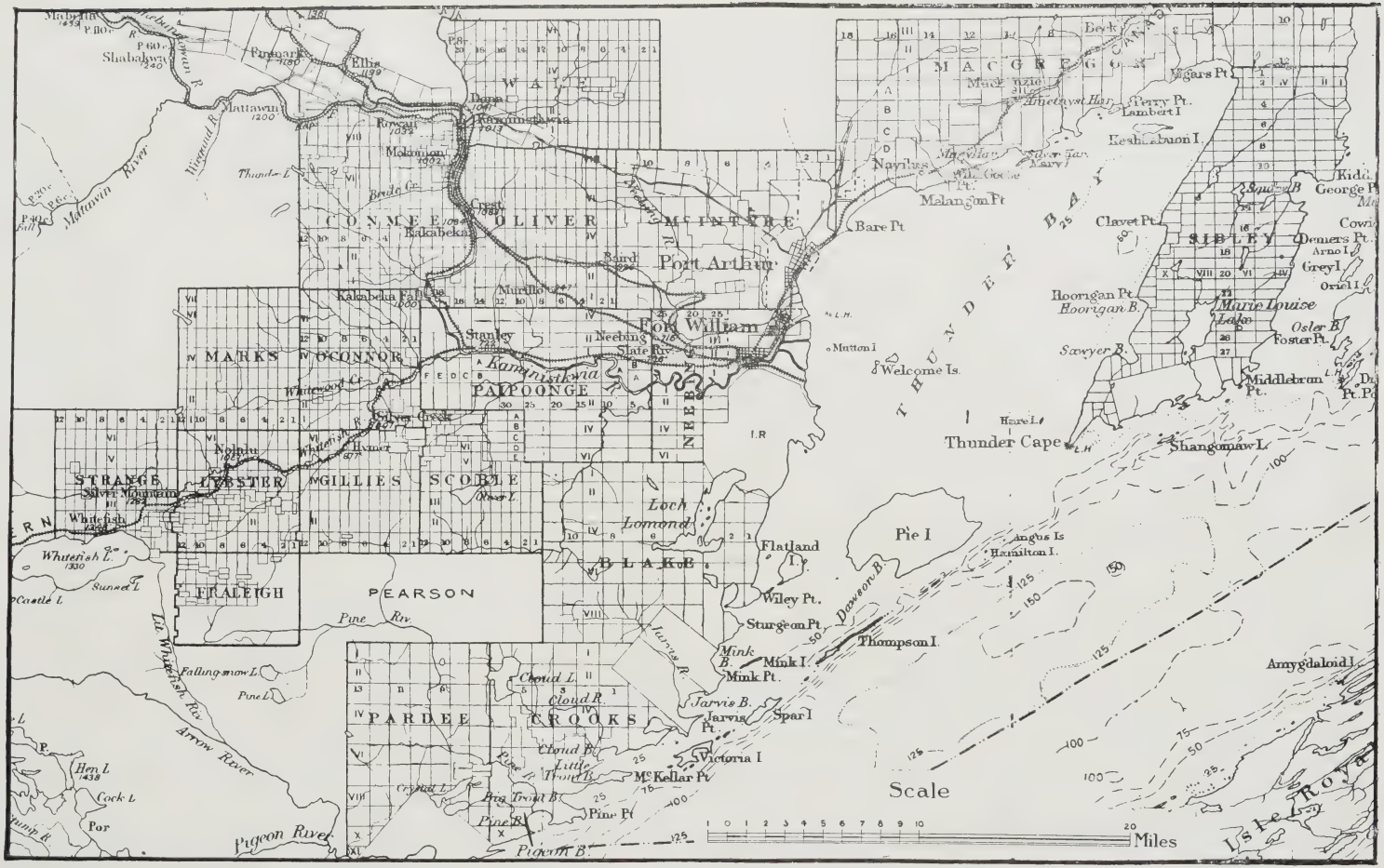


Looking southeast from Rabbit mountain.

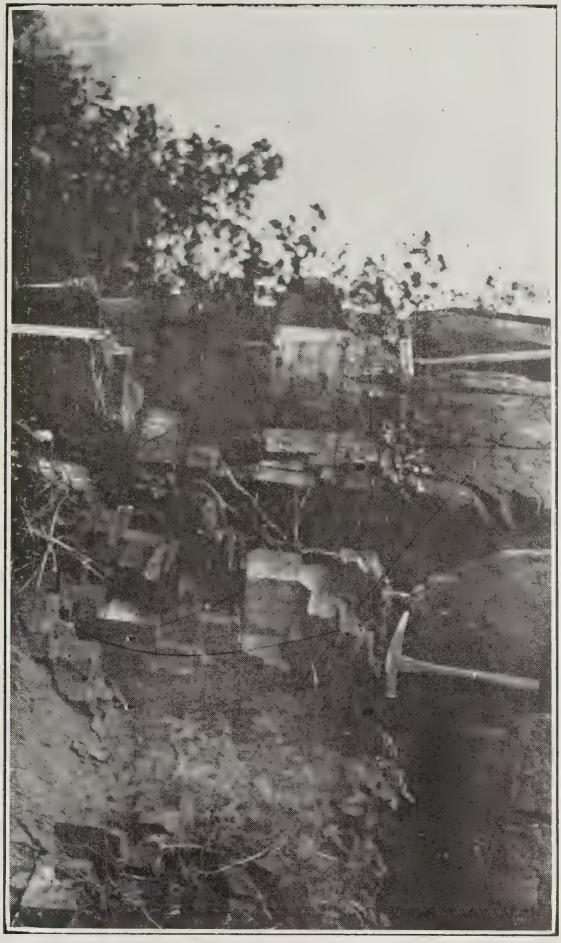
Topography and Drainage

The area is one of bold relief. The differential elevation is not great, but the hills usually rise from the valleys with steep or even cliff-like faces, the result of erosion, in nearly horizontal, hard and soft beds. A stream, having once cut through a diabase

[1] A somewhat detailed description of the economic resources of this district was published by Mr. E. D. Ingall in the Report of the Geological Survey of Canada, for 1887. The present report is intended to supplement that of Mr. Ingall.



Key Plan showing location of Silver Mountain Area, near Fort William, on the North Shore of L. Superior.



Massive diabase resting on gray quartzite.



Table hill illustrating structure.

sill, lowers its bed very rapidly in the softer sediments, leaving diabase-capped hills either as isolated "table tops" or as ridges with steep northward faces and gentle southern slopes, approximately parallel to the dip of the "hard bed," in this case a diabase sill. Only on the steep sides of the hills are good rock exposures to be obtained; the valleys are filled to a considerable depth with glacial detritus.

The drainage is characterized by a well-defined stream system. Swamps and lakes are few. The contrast with the ill-defined drainage of much of the pre-Cambrian area of Canada is marked. It can hardly be doubted that the present disposition of hill and valley was established in pre-glacial time and was but little modified by glacial erosion. Post-glacial time has been sufficient merely for the cutting of stream beds in the drift which the retreating glacier left.

The valleys support a growing number of prosperous settlers.



Terrace of the Whitefish at Hymers.

Geology

The rocks of the area, other than the glacial deposits, are all of pre-Cambrian age. To the north is a great area of granitoid gneiss known as the Laurentian. To the south the gneiss is overlain by the sediments of the Animikie or Upper Huronian.

In the Animikie are intrusive sills of diabase, presumably Keweenawan.

Tabular View of Formations

Glacial and Recent.—Boulder clay, stratified sands and clays. Great uncomformity.

Keweenawan.—Intrusive sills and dikes of diabase (Logan sills). Intrusive relationship.

Upper Huronian or Animikie.—Gray argillites. Gray quartzite with gray slate interstratified. Black slate. Iron formation (jasper, chert, pyritic slate, greenalite rock, etc.). Great unconformity.

Laurentian.—Granitoid complex.

The Laurentian

The Laurentian is made up of somewhat gneissic rocks, usually granitic, but sometimes syenitic or even dioritic. A specimen taken from an outcrop on the Kaministiquia, about a mile above the Kakabeka falls, showed, in thin section, quartz, orthoclase, plagioclase, and muscovite. There are no features of special interest in this connection, and little time was put on the gneiss area.

The Animikie or Upper Huronian

The Animikie is one of the great pre-Cambrian sedimentary series. The term Animikie was first used in this area, and the Upper Huronian age was determined by the correlation work of the International Committee of Canadian and United States geologists in 1904.

The Animikie beds have in this area a gentle average dip to the southeast, the lowermost beds outcropping towards the north and the higher farther south. The relation between the Animikie and the gneiss is to be seen in many parts of the area. The main contact between the two systems is usually a fault contact. A good exposure is to be seen on the western boundary of Strange township in the bed of the Whitefish river. Gneiss forms the northern bank of the stream and the Animikie sediments the southern. Approaching the gneiss the beds rapidly assume a steeper and steeper dip, and near the contact are almost vertical. The sediment is a greenish slate, and does not represent the base of the Animikie. Within the gneiss area small outlying patches of jasper are found which represent the base.

The complete section is shown near the Kakabeka falls on the Kaministiquia river. Here the increased dip of the sediment is not so marked, and the gneiss can be seen dipping under the cherty beds at the base of the Animikie. There is no detrital material at the base, and this fact, together with the disturbed condition of the beds, might be taken as evidence of an intrusive nature for the granite. However, no contact effects are to be seen, and no stringers run out from the mass of granite. On the whole, therefore, the conclusion is that the sediment is younger than the gneiss, which, indeed, formed the floor on which it was laid, and that the disturbance of the beds is due to later movements. It is rather remarkable that only along this contact is any serious disturbance of the Animikie beds to be noted. It will be seen that only the pre-Animikie age of the granite is established. There are post-Lower Huronian granites near by, but it is highly probable that this vast area belongs to the pre-Huronian complex (Laurentian).

A reference to the tabular view shows that the Animikie has at the base the sediments of the iron formation overlain by black slate, this by gray quartzite, and finally by gray argillites.

It is the Animikie iron formation in which are found the deposits of the Mesabi range, the greatest of North American iron ranges. In the area under discussion the iron formation outcrops along the north fringe of the series, and consists of jaspers, cherts, pyritic slates, and greenalite rocks. No detailed description of these sediments will be given. Slides of typical specimens were examined and compared with photomicrographs in Leith's monograph on the Mesabi. Nothing of special interest in this connection was noted.

The black slate division outcrops in a belt immediately south of the iron formation. It is important as being a silver-bearing horizon.

On surfaces exposed to the weather the slates are decidedly fissile, cleaving into thin plates; but in fresh workings the rock is rather massively bedded. This effect of the weather makes the slate crumble easily, so that it never outcrops of itself, but only where held up, as it were, by an overlying sill of diabase.

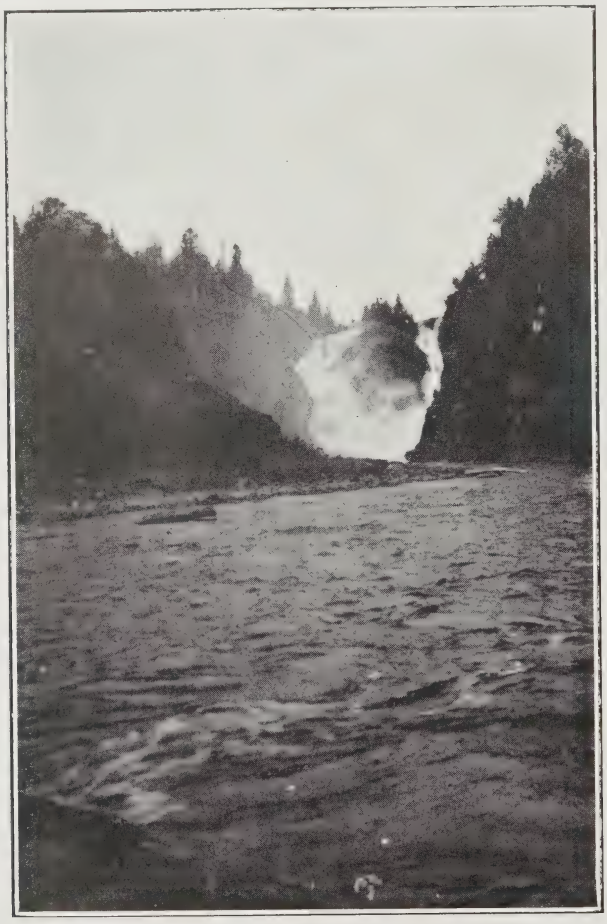
The outcrops of the black slates are, then, to be found only on the steeper hillsides, and are on the whole rare. In the Rabbit Mountain area, frequent outcrops are found on the sides of the diabase-capped hills, and so also in the Silver Mountain area; but in the intervening belt no diabase was intruded immediately above the black slates, or if it was, it has been cut away and the belt is low and drift-covered. The hillsides to the south show only the next higher division of the Animikie, the gray quartzite, so that there are here no black slate outcrops. Since the silver discoveries of this belt were always made in the black slate hillsides beneath the diabase, we have in the erosional development an explanation of the grouping of the finds into the Rabbit Mountain group and Silver Mountain group.

The term slate is used rather loosely, for the only cleavage is parallel to the bedding. The rock is fine-grained, rather soft, and owes its black color to the presence of

carbonaceous matter. Most of the workings, including the Beaver, Porcupine, Rabbit Mountain, Silver Mountain, and others, are in the black slates.

The gray quartzite division overlies and outcrops in a belt to the south of the black slates. With the quartzite are interbedded frequent layers of a gray slate. In the lower parts the gray slate predominates and is probably the same rock as the black slate, lacking the carbonaceous matter. The quartzite itself is hard, greenish-gray, fine-grained, and feldspathic. Its beds average about one foot thick. Although much more resistant than the black slate, it, too, outcrops only on hillsides beneath diabase.

This is the highest division of the Animikie, that occurs in the area where detailed work was done. To the south comes in the belt of gray argillites, dark gray, heavy bedded, and somewhat metamorphosed shales, usually carbonaceous.



Kakabeka falls and gorge in Animikie strata

The Animikie beds, as a whole, except as pointed out above, near their contact with the Laurentian, have a gentle dip, usually about 5 degrees, but sometimes more or less. The direction of dip ranges from southeast to southwest, the average, as shown by the general strike, being S. S. E. Rarely the dip may be northerly, as was observed on the shores of Oliver lake.

The thickness of the Animikie has been estimated from its horizontal extension and average dip to be over 12,000 feet. This estimate includes the sills, which amount

to nearly one half and do not properly belong. Moreover, faults are numerous in the Animikie. They are never extensive enough to be conspicuous, but in the zone of vein workings they are frequent, and there is no reason to believe they are any less numerous outside of this zone. They are all normal faults, and the effect has been to greatly increase the apparent thickness. It is probable, therefore, that the total thickness is closer to 5,000 feet, apportioned approximately as follows:

Quartzite and argillite	3,500 feet.
Black slate	500 feet.
Iron formation	1,000 feet.



Patches of slate on top of diabase sill, Current River park, Port Arthur.

Diabase (Keweenawan)

Intrusive sills of diabase are numerous in the Animikie strata. All the hills are capped by this resistant rock. This fact led to the erroneous idea that the diabase was a single flow poured out on the surface and led to the name of "crowning overflow." Lawson exploded this idea in his paper on the "Laccolithic Sills of the North West Coast of Lake Superior," where he maintained that the diabase represented a number of intrusive sills at different horizons.

There is abundant evidence of the truth of this statement.[2] It has been pointed out that the southern slopes of the hills commonly correspond with the dip of a sill; indeed, the top of the hill in many cases is the absolute top of the sill. With careful search, small thin patches of sediment, baked by the contact action, can be found on top of the intrusive. Another interesting feature to be seen where the tops of the sills have been thus laid bare are the contraction dikelets which cut the diabase in a confused network, evidently filling cracks formed in the suddenly chilled outer portion of the sill.

The steep northward slopes of the diabase show a vertical columnar jointing which gives rise to the cliff faces. Great quantities of talus accumulate at the base of the cliffs. The rate at which the cliffs recede must be quite fast, for, according to the observations of settlers, large masses are hurled down every winter.

[2] Ingall "Mines and Mining on Lake Superior," Geol Surv., Can., 1887.



Top of a diabase sill, showing contraction dikelets, lot 10, con. I., township of Gillies.



A diabase talus slope.

The sills range in thickness from a few feet to five or six hundred feet. The evidence for their laccolithic nature is scanty because of the removal of overlying sediments, but in a few places small patches are left in such an attitude as to indicate an arching of the strata. An example is shown on a hillside on R40, Scoble.

The diabase is a fine-grained, dark rock composed of labradorite and augite in ophitic structure, with some biotite, apatite, iron ores, and generally a little quartz. In one specimen from a small sill, quartz was absent and considerable olivine present. A few feet from an upper or lower contact the diabase commonly becomes porphyritic, showing phenocrysts of feldspar. The phenocrysts have in many cases collected into bubble-like masses, 2 to 10 feet in diameter, anorthosites in composition but lacking sufficient size to be considered geologic units. It is possible that by an extension of this process bodies of anorthosite might be produced.

The contact effect of the diabase on the iron formation, black slates, and the quartzite of the Animikie is confined to a slight baking and bleaching. With the argillites, however, interesting contact effects are to be noted. The numerous good sections along the shores of Lake Superior show the development of reddish adinoles at the contacts, and in some cases the action has been so intense as to completely recrystallize the adinole, giving it the texture of a granophyre. Ingall noted this at many places. The writer examined only the Spar Island example.

Glacial and Recent

Much of the surface is covered by glacial till, chiefly unassorted boulder clay. In the valleys these materials have been worked over by streams, giving some stratified sands and clays into which the streams are now cutting their valleys.

The direction of glacial striæ observed at a few points is S. 38 to 44 degrees W.

Economic Geology

The veins of the black slate belt occur in fault fissures with a general northeast strike and dip 60 to 90 degrees. The outcroppings were usually discovered in slates near the base of a diabase sill or else in the sill itself, and thence followed downward to the slates, where the best values are found.

Silver is present as argentite and native silver, associated with zinc blende, galena and pyrite. The gangue is calcite, quartz and fluorite, with sometimes barite and witherite.

The most important find outside the belt of black slates was that at Silver Islet, and with this may be grouped a number of minor finds on the shores and islands of Lake Superior. These are all in the belt of gray argillites; a north and south strike is common, and they are all near diabase intrusions. At Silver Islet, for example, a diabase dike cuts the argillites and the vein cuts both. Only in the part of the vein enclosed between diabase walls were values obtained.

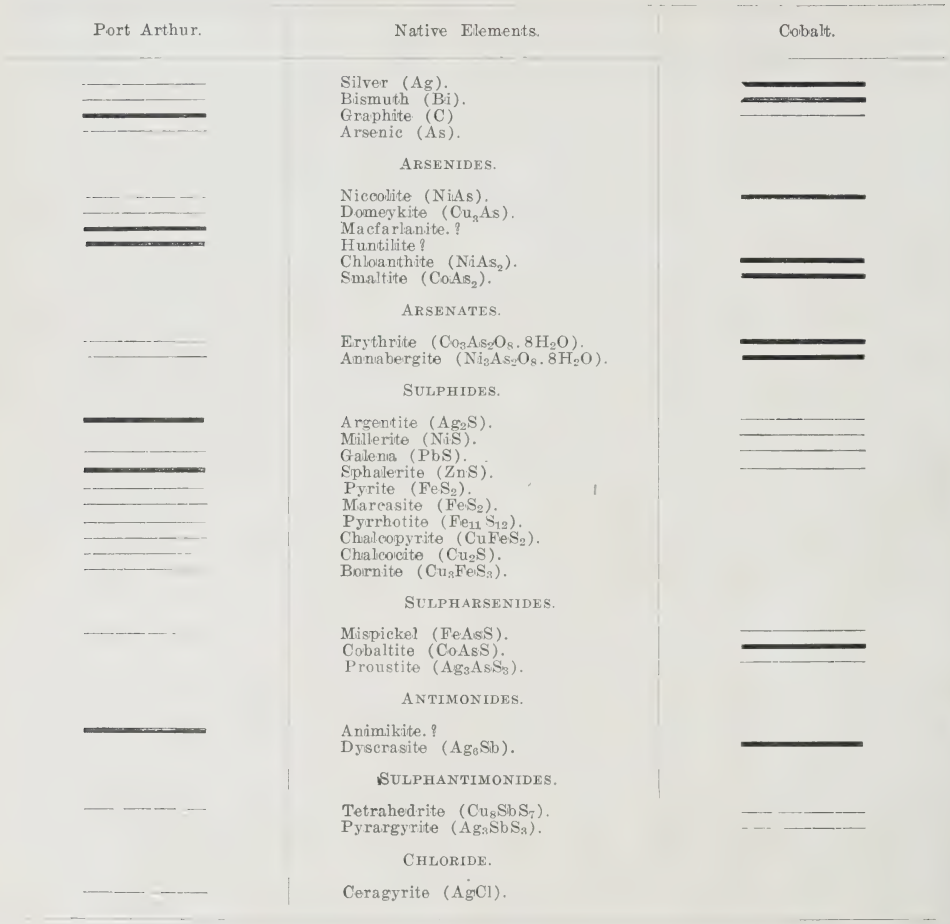
The mineral assemblage of this group of veins is in general the same as that of the black slate group. At Silver Islet some arsenical ores were found.

The association of the veins with diabase intrusions suggests the origin of the ore minerals in waters accompanying the diabase. Although it might at first sight seem so, this conclusion is not contradicted by the fact that the diabase itself suffered faulting and fissuring before the time of vein filling, for it is well known that, in volcanic districts, warm mineral-laden waters circulate in fissures (forming hot springs when they reach the surface) at a time long after that at which volcanic activity itself has ceased.

The general relation is somewhat similar to that in the Cobalt district; indeed, it is probable that mineralization in the two districts was approximately of the same period.

Dr. W. G. Miller, in his report on the Cobalt area, has compared the two camps at some length.[3] It may be of interest to give here a table showing the contents of the veins in metallic minerals.

[3]Cobalt-Nickel Arsenides and Silver Deposits of Temiskaming, Ont. Bur. Mines, Vol. XVI., 1907, pt. II.



NOTE.—A line opposite the name of a mineral and beneath the name of the district denotes the presence of the mineral in that district. Lack of the line indicates that the mineral has not been noted in the district. The heavy lines show special prominence of the mineral indicated.

There is evidence favoring the idea that carbonaceous matter of the sediment may have been active as precipitant of the ore minerals. The rich silver finds of the black (carbonaceous) slate belt are effectively limited to the north by the iron formation and to the south by the quartzite; and the gray argillite with its group of finds is also decidedly carbonaceous.

An alternative explanation of the larger number of veins being found in the black slates is that the belt where the slates now occur at the surface was a zone of more marked faulting. This is probably not the case, for there are numerous veins occupying fault fissures in the other divisions of the series. The question could, of course, be decided by following veins downward from the black slates into the underlying iron formation. This has been done at least in one of the mines, but no definite data as to the nature of ore bodies encountered are obtainable.

Properties

It has been pointed out that only a little test work has been done in the district since 1903. The facilities for examining properties were therefore poor, and but little new information could be obtained on those which have been closed for some time.

Black Slate Belt Group

West End Silver Mountain mine, R. 56 Lybster.

The vein worked on this property is typical of all the veins of the group. It occurs in the black slate beneath a diabase sill. The ore minerals are argentite, native silver, galena, sphalerite and pyrite, and the gangue calcite, quartz and fluorite.

The old workings are among the most extensive in the district. A total of $365,681 produced from 1898 to 1903 came almost entirely from this property. Little work was being done at the time of the writer's visit. The mine was kept pumped out. Where a good pocket was shown on any of the faces, a shot was put in and the best taken. In this way a carload of ore was made up from time to time. No attempt was being made to mine large quantities and concentrate, as was formerly the practice there. It is difficult to state what hope of success there would be in such a course. The vein is still strong in most of the drifts, but the ore is lean. Whether undiscovered pay shoots would be encountered remains to be proven by vigorous development.

Beaver mine, 97 T., O'Connor.

The Beaver mine was closed down in 1891, after producing over half a million dollars. For sixteen years it lay idle. In the fall of 1907, pumping out was begun. The old mill having been burned, a new one was constructed, the purpose being to concentrate the low grade ore of the old dumps and new ore from the mine. With the first run, it is said, the mill was found to be of faulty construction, the whole was closed down, and has so remained since. It is unfortunate that the work was not persisted in, for this property, the richest of the group, would have furnished a good test case as to whether properties closed in the "crash," when silver prices suffered so severe a fall, could be worked under the existing conditions. The main vein has an average width of about four feet and, unlike the rest of the group, strikes in a northwest direction. It was characterized by its bonanza shoots.



New mill at the Beaver mine.

The Porcupine mine, 96 T., Gillies.

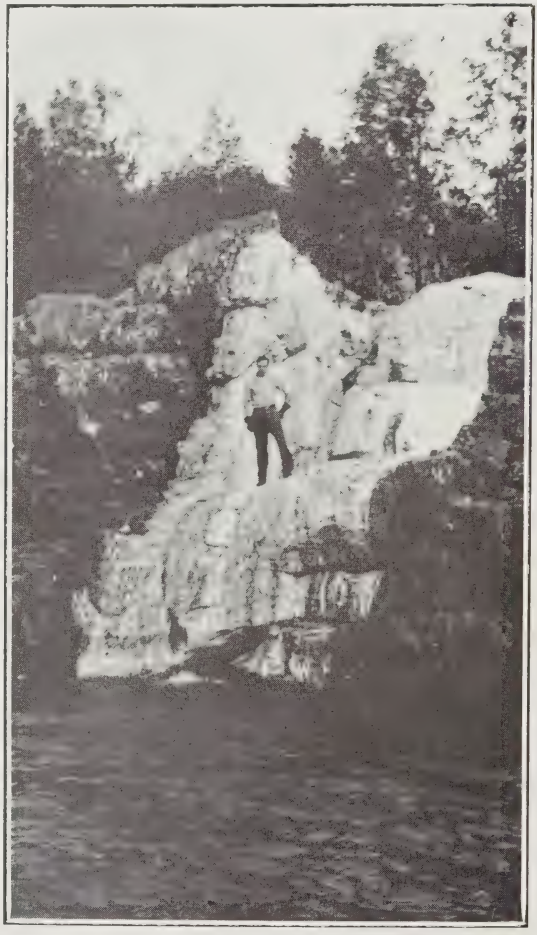
The Porcupine was one of the important producers in the days of active mining. In recent years it has been re-opened a number of times. Pockets rich in native silver and argentite were encountered, but owing to the discouragement caused by lean portions, the work has always been given up.

The workings show a strong vein, averaging about four feet in width, and well mineralized in places.

Climax, 145 T., O'Connor.

On the Climax property testing has been done on three veins with an approximately parallel (N.E.) strike, and each of an average width of about one foot. In 1891 a small quantity of rich ore was taken from one of these veins, but the workings have now caved in.

On another of these, a shaft was being sunk at the time of the writer's visit, and a depth of 60 feet had been attained. The vein dips 60 degrees north, lying in a fault fissure, the extent of faulting being about 30 feet. In the upper portions of the vein the down faulted diabase sill forms one wall with slate as the other, but in the lower portions slate forms both walls. The mineralization is moderate, with a fair sprinkling of argentite in places, more especially along the hanging wall.



Spar island vein.

West Beaver, 140 T., O'Connor.

On the West Beaver property, there are two veins. The "Little Pig" vein was worked some years ago. The other vein is being tested at present. An adit 250 feet long has been driven into the hillside and a shaft about 80 feet deep sunk to meet the adit. The vein averages about one foot in width. There were in the ore-house a few tons of good ore, said to have come from the shaft.

Silver Creek, 95 T., Gillies.

No recent work has been done on the Silver Creek property, but some years ago a tunnel was driven on the vein into the hillside. Where entered upon, the vein was strong, having a width of about two and a half feet, but it gradually pinched to a mere stringer. On sinking, some rich ore was obtained. Work was discontinued, the intention being to re-establish operations on a larger scale, but the general closing down following shortly, the plan was never carried out.

At the Badger, Rabbit Mountain, and others, the workings were in such condition that nothing could be seen.

Stewart and Hewittson's Vein.

During the summer of 1910, a vein was discovered in a quarry within the townsite of Port Arthur, belonging to the above-named contractors. The vein occurs in a fault fissure in the black slates beneath a diabase sill. The vein stuff has a width of about one foot, and is in places rich in argentite and native silver. At the time of the writer's visit it was exposed for only four or five feet in the quarry wall.

Argillite Belt Group

The Silver Islet vein, the greatest producer of the district, occurs in the gray argillite belt. The mine has been closed since 1884. A few other veins have been exploited on the shores and islands of Lake Superior, all of them with little success. Only one of these, the Spar Island vein, is being worked at the present time. After lying idle many years, work was renewed here during the present year. The vein is a strong one, 10 to 14 feet in width, cutting in a direction north 20 degrees west across the gray argillites and two diabase dikes. The veinstuff is chiefly calcite and barite with a little gray copper ore (tetrahedrite), some bornite and pyrite. At times, pockets of sphalerite carrying values in silver are encountered. The mineralization is on the whole not great.

General Summary

It will be noted that special attention was paid to the belt of black slates, the reason being that recent work has made possible the examination of properties there.

It has been mentioned that all of these properties closed with the fall in the price of silver in 1892. The price of silver is still low, but methods of mining and ore-dressing, and more especially, transportation facilities, have been much improved, A few veins had been but recently discovered, but, as is always the case in a slump, they were abandoned with the rest. Whether these veins could be worked under conditions now prevailing is a question which has never been fairly tested. Favoring the possibility is the case of the West End mine, which, after being abandoned with the rest, was re-opened in 1898, producing nearly $400,000 during five years, presumably with some profit.

The few finds of silver ore that were made in the iron formation division proved to be mere pockets. Veins passing downward from the black slate into the iron formation would be expected to show deterioration in value. Such an experience seems to have been met with in those workings which attained that depth, but the facts are not available. It has been mentioned that the black slate has a maximum thickness of between four and five hundred feet. The belt continues westward from the silver area, finally passing into the state of Minnesota, the thickness of black slate here being 900 feet. This western extension has never been prospected.

The experience of Silver Islet would lead one to expect much from veins in the gray argillite division, but the small amount of work which has been done on several veins has not fulfilled this expectation. It seems improbable that the Silver Islet vein should be unique, and it must be said that the area has never received careful prospecting. Large tracts of land were acquired under older mining laws. This land

is simply held for sale at such time as the work of the bona fide miner may give the land a prospective value. Such a system is decidedly detrimental to the development of the country.

The occurrence of two rich silver camps in Northern Ontario, that at Cobalt and that near Port Arthur, separated from each other by a stretch of 500 miles of Huronian rocks, makes bright the prospect of important silver finds over a large area, now little known.

Production of District

Year.	Value.
Prior to 1887	$3,349,338
1887	190,495
1888	208,064
1889	162,309
1890	166,652
1891	221,120
1892	36,072
1898	51,960
1899	65,575
1900	96,367
1901	84,830
1902	58,000
1903	8,949
Total	$4,699,731

Mr. W. A. Preston, M.P.P., has estimated the production of the individual mines as follows:

Silver Islet	$3,250,000
Silver Mountain, East and West	500,000
Beaver	550,000
Badger and Porcupine	300,000
Rabbit Mountain	50,000
Thunder Bay	20,000
Shuniah	50,000
3 A. and Beck	10,000
Jarvis Mining Co.	40,000
Total	$4,770,000

THE STURGEON LAKE GOLD FIELD

BY E. S. MOORE

Introduction

The first work of which there is any record was done in the Sturgeon Lake Gold field about ten years ago. Since then the reputation of the field has risen and waned several times, as discoveries of gold have been made or better transportation facilities provided.

The writer's first visit to the region was made during the latter part of the field season of 1909, and a summary report on it was published in the 19th Report of the Bureau of Mines. When that report was published it was deemed advisable, on account of renewed interest in the region and the need of a good map of the complicated lake, to postpone the publication of a final report until the following year. To obtain the necessary data for this report the writer was instructed by Mr. Thomas W. Gibson, Deputy Minister of Mines, to spend a portion of the field season of 1910 in this region and to make a detailed map of the northern half of the lake. This map on a scale of 40 chains to an inch was prepared by the use of the prismatic compass and micrometer, and although the lake has an extremely irregular shore line an attempt was made to make an accurate survey of it. On the map there have been laid down all the surveyed claims of which we could obtain records and which could be located, no attempt being made to plot any of the prospectors' claims not laid out by a surveyor. A key map taken from a large map published by the Canadian Geological Survey furnishes an outline of the topography of the whole Sturgeon Lake region and the relative position of the Sturgeon Lake Gold field, and those desiring a map covering a larger area in this district are referred to the Geological Survey map on a scale of four miles to an inch, which was found of much service in my work.[1]

During the season I had as assistant, Mr. Thomas Firth, who performed most of the topographic work, and my acknowledgments are due to him and to Mr. O. Bowles, another member of the party, for their assistance and the very active interest they exhibited in the work. I wish also to express my thanks to many in the region who rendered assistance and favors to our party, especially to Mr. A. L. McEwan, manager of the St. Anthony mine, Captain Cross, Mr. T. K. Barnard and Mr. J. W. Morgan, Mining Recorder at Port Arthur.

The final draft of the accompanying map has been prepared by Mr. W. R. Rogers, topographer of the Bureau of Mines, to whom much credit is due for the pains he has taken in compiling and adjusting the mining claims.

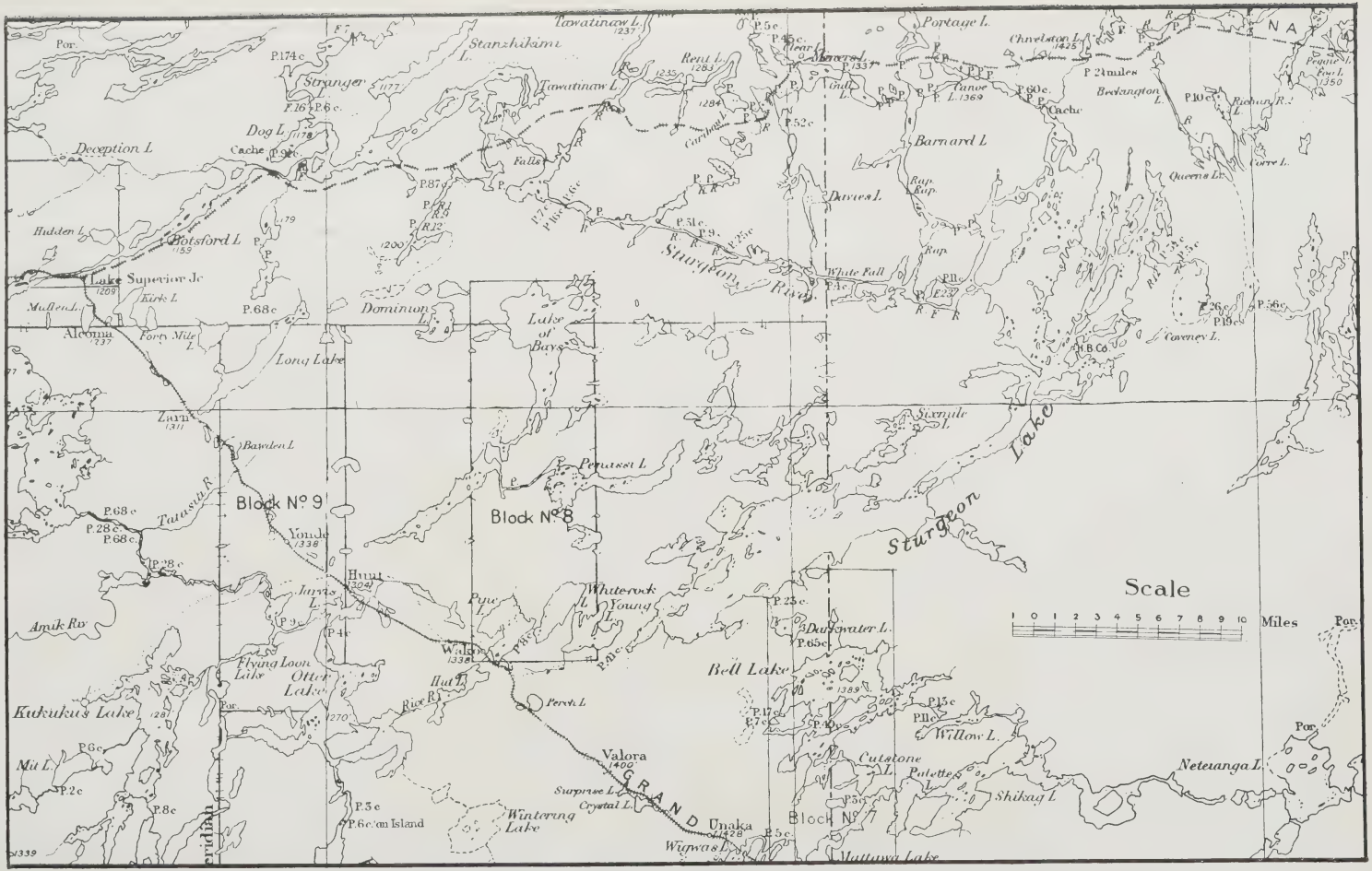
History of the Field

According to Mr. W. McInnes, of the Canadian Geological Survey, who seems to have been the first geologist to describe Sturgeon lake and the geology of its vicinity, gold was discovered on Sturgeon lake in the summer of 1898, when a number of claims were staked.[2] A little later than this the most important deposit of the region, now owned by the St. Anthony Mining Company, and at first known as the Jack Lake mine, was discovered, and in 1901 Dr. A. P. Coleman describes the work which was being done on this property.[3] A little to the north of it the Sturgeon Lake Mining Company had erected a stamp mill and installed machinery on the Dawson property, named after G. Dawson, president of the company. Mining continued, with periods of cessation, at the St. Anthony Reef mine, until 1908, when it ceased, and almost no mining work has been done since, although some new camps and other buildings were erected last summer and underground development work was begun.

[1]Map of Explored Routes in a portion of Northwestern Ontario traversed by the National Transcontinental Ry. between Lake Nipigon and Sturgeon Lake; Canadian Geological Survey; map No. 993.

[2]Summary Report of the Canadian Geological Survey, 1899, pp. 118-120A.

[3]Bur. Min., Vol. XI. (1902), p. 148.



Key Plan showing position of Sturgeon Lake relative to the National Transcontinental Ry. and Grand Trunk Pacific Ry. (L. Superior branch).

During the years 1901-2 the United States Gold Mining Company did considerable work on what is known as the Shore properties, near the west end of King's bay and on claim B. G. 136 on the southwest shore of North bay. Three shafts were sunk on the former property and a tunnel about 50 feet long driven into a hill on the latter.

The work on those properties being unsatisfactory, they were abandoned the next year, and nothing has been done with them since.

Camps were built and shafts were sunk on the Symmes prospect on B. G. 139 on North bay about the same time as those mentioned above. About this time also the camps at the Northern Light and other properties near the northern part of Northeast bay were erected, but soon fell into disuse.



Fig. 1.—Our camp at the old Dawson mine, Sturgeon lake.

In 1906-8 there was some activity in the vicinity of Belmore bay, where the Belmore Bay Mining Company sank a shaft 260 feet deep and built a three-stamp mill, and the Douglas Mining Company did a considerable amount of development work.

In 1909 prospecting received a new impetus through the construction of the Lake Superior Branch of the G. T. P. and the establishment of steamer lines on the lake for the transportation of materials for railway construction. These afforded facilities for easy access to the region, and a good many prospectors entered the district, but the boom was only temporary. On account of the delightful lake, the ease with which the region can be reached and supplies obtained, it has often seemed that many prospectors have found it a very desirable one in which to spend a summer at the expense of someone else, and this has led to the foolish and useless expenditure of time and money on what has been called development work. Efforts have been made to sell properties that are known to be absolutely valueless. Many large pits have been sunk in rock where there is almost no sign of quartz and no gold in what quartz there is.



Fig. 2.—Hotel at O'Brien, Sturgeon lake.



Fig. 3.—Steamer on Sturgeon lake.

Besides the writers already mentioned, several others have written geological notes on the Sturgeon lake region. Among these are Dr. W. G. Miller, who in 1902 wrote a good account of many of the deposits.[4] W. H. Collins of the Canadian Geological Survey,[5] and E. T. Corkill, Inspector of Mines,[6] have written briefer notes on the mines.

The lake after which the field is named is about 45 miles long, and the northern half is divided into two large arms known as North bay and Northeast bay. It lies across the boundary between the Districts of Rainy River and Thunder Bay, and in 50 degrees north latitude. A spur line about six miles long runs from the lake to the Lake Superior Branch of the Grand Trunk Pacific Railway, at W. O. junction, about 154 miles from Westfort, near Fort William. The field is thus easily accessible, and when the Transcontinental main line is complete it will pass about three miles north of the lake.



Fig. 4.—Sturgeon Lake Hotel, 1909.

Geology

The rocks round Sturgeon lake form an extremely complex igneous series of extrusions and intrusions. There are very few sediments in the area, and none of them form definite geological horizons. The only sediments recognized with certainty were a few patches of graywacké, arkose and dolomite, the former being found in the open cut at the St. Anthony mine, the arkose at the Dawson and Shore mines, and the dolomite on Claim H.W. 705 and on Morgan Island. Besides these there are some masses of a fine grained gray gneiss or schist, which is believed to be partly sedimentary in origin. It is finer in grain, more granular in texture, and as a rule lighter in color than the granite gneiss. It is similar to large areas of rock found by the writer in the Lake Savant area.[7]

[4] W. G. Miller, Bur. Min., Vol. XII. (1903), pp. 83-6 and 104-5.
[5] W. H. Collins. The Region between Lake Nipigon and Clay Lake. Canadian Geological Survey, 1909.
[6] E. T. Corkill, Bur. Min., Vol. XVI. (1907), p. 60. Ibid., Vol. XVII. (1908), pp. 65-66. Ibid. Vol. XVIII. (1909), pp. 81-82. Ibid., Vol. XIX. (1910), p. 79.
[7] Lake Savant Iron Range Area. Bur. Min., Vol. XIX. (1910). p. 183.

The igneous rocks consist of granites and their metamorphic equivalents, gneisses, aplites, quartz-porphyries, rhyolites, hornblende-syenites, diorites, diabases, basalts, gabbros and porphyrites. Dr. W. G. Miller described boulders of nepheline-syenite which he found near East bay, but we did not locate any of this rock in our work.[8]

On the accompanying map a number of these rocks have been differentiated, but they are so intermingled that only the larger areas of each type could be laid down, and these areas often include small patches of the other rocks. There are represented a few small areas of agglomerate and breccia, which in some cases are crush-breccias and in others probably flow-breccias and agglomerates, the latter consisting of fragmental material ejected from volcanoes.

An attempt has been made to separate these rocks according to their relative geological age, but the only definite arrangement that can be made is on a purely lithological basis. There are no sedimentary rocks in the area which furnish definite geological horizons. The granite along the western portion of the field, designated the



Fig. 5.—Acid granite dikes cutting arkose and biotite-granite gneiss.

Sturgeon Lake granite because of its prominence in the area, is by no means typically Laurentian, and some of the quartz-porphyries are older, some equivalent in age, and some younger than the great mass of the granite.

Many of the greenstones and schists, as well as the quartz-porphyries, are typically Keewatin, but there are some greenstone dikes cutting the granite, and there are many masses of comparatively fresh-looking gabbro and diorite apparently much later than the older rocks of the area, and often cutting the quartz-porphyries, which are younger than the oldest of the greenstones.

Age of the Granite

The age and association of the granite is interesting because of the apparent relation between it and the ore deposits, and of the petrographic character of the rocks. This granite has usually been regarded as of Laurentian age and has

[8] Bur. Min., Vol. XII. (1903), pp. 104-5, and Am. Geol., Sept., 1903.

been mapped as such by previous investigators in this region. It was found, however, that it is not typically Laurentian, as much of it is not gneissic at all and looks like a comparatively fresh rock. The eastern portion of it is porphyritic and in places grades over into quartz-porphyry. None of these features are absolutely opposed to the rocks being Laurentian, but they are not typical of rocks of that age.

It was at first thought possible to separate the granite along the west shore of North bay, where some of it is metamorphosed to a gneiss and in places cut by numerous granite dikes (Fig. 5), from a younger porphyritic granite along the eastern portion of the bay, which contains few of these dikes. The work on the whole area, however, failed to show any means of doing this, and also indicated that the two types pass into one another by imperceptible gradations. In some places the granite has been locally more metamorphosed than in others, giving rise to the patches of gneiss, and the porphyritic phase seems to be due to differentiation influenced by the contact with the Keewatin greenstones.



Fig. 6.—Intrusion of quartz-porphyry into greenstone.

The age of the numerous dikes of granite, felsite and aplite, is doubtful. These dikes were first observed near the northern end of North bay, where they cut biotite-gneiss and a fine-grained gray gneiss or schist, the latter probably of Keewatin age. It was thought that they belonged to the later porphyritic granite, but they were found to be connected with the main mass of the granite in the vicinity, and later, similar dikes were found cutting the porphyritic granite on the east shore of the bay. Dikes of felsite and aplite were also found cutting the greenstones at considerable distances from the granite mass. The assumption that there are granites of two distinct ages in this area is supported by the fact that at Unaka, a station of the G. T. P. Ry., a few miles east of Sturgeon lake, there are distinct granite dikes cutting a typical highly metamorphosed Laurentian gneiss. In this case the granite had been folded and metamorphosed before the dikes were intruded, and this was thought to be the

case on the northwest portion of Sturgeon lake, but the pegmatitic and aplitic character of so many of the dikes suggested that they may have originated as a later phase from the same magma as the granite, in some such order as suggested in the next section of this report.

That some of the quartz-porphyry is older than the granite is shown at the St. Anthony mine, where the latter cuts a schistose phase of the former; and that there is quartz-porphyry of the same age as the granite is shown by the gradation of one into the other. The small area of porphyry near the mouth of the creek draining Couture lake cuts the granite and is therefore younger.

The large mass of hornblende-syenite along the east side of the narrows is younger than the greenstones of the region, and is a comparatively fresh rock, but beyond that nothing can be said about its age. It is not improbable that it is related to the Sturgeon Lake granite and of similar age.

As to the age of the dolomite, little can be said beyond the fact that it is older than the quartz veins which cut it in some places.

Regarding the age of the rocks of the area, it is the writer's opinion that there are basic rocks of ages varying from Keewatin to Keweenawan, quartz-porphyries of Keewatin to at least Huronian age, and that the Sturgeon Lake granite is later than Laurentian and is possibly Huronian in age.

Vein Characteristics

The veins are largely fissure fillings. They are as a rule very irregular, because the cavities were formed along contacts between different types of rock, along planes of cleavage and fissility in schists, and in igneous rocks by unequal cooling and torsion. In one case a considerable fissure was opened along a fault plane at the St. Anthony mine.

The gangue is predominantly quartz, although some calcite and siderite occur. The sulphides are pyrite, chalcopyrite, galena, zinc blende, pyrrhotite and pyrolusite. The ores are largely free-milling. The upper portions of the veins, owing to oxidation and concentration, often show splendid specimens of free gold.

Four stamp mills have been installed in the region, but only one, that at the St. Anthony mine, has handled any considerable quantity of ore. This mine has produced a good deal of ore, but it is difficult to procure records of the quantity and value. Many shafts have been sunk and a great number of test-pits dug on more than two hundred claims which have been recorded in this field.

Mines and Prospects

The United States Gold Mining Company

The properties controlled by this company are locally known as the "Shore properties," from the name of the man who managed them. One of these properties includes the claims A. L. 367 and 368 near the west end of King's bay, and the other B. G. 136 on the south west shore of North bay. On the former of these there are a few old camps, and a two-stamp mill with boilers, crusher and an old vanner. Work was carried on here about ten years ago, and Dr. W. G. Miller describes the workings about that time.[9] He states that this company was the third largest operator during the year, 8 men being employed on the surface, but no mining was done, and shortly afterwards all operations ceased. Shaft No. 1 near the mill was said to have a depth of 100 feet, and No. 3, near the water's edge, 60 feet. There was a combined open cut and tunnel, which ran about 125 feet N. 60° W. into the hill side. No. 2 shaft, which lies back on the hill, was 70 feet deep, but had been abandoned.

The rock on this property consists of greenstone and banded arkose and slate intruded by quartz-porphyry and porphyritic granite which are believed to be related. There is a band of this rock impregnated with pyrite, pyrrhotite, marcasite, calcite and quartz running nearly east and west along the shore of the lake. The porphyry and granite contain considerable pyrite, and the pyrite in the other rocks is evidently

[9] Bur. Min., Vol. XII. (1903), p. 85.

secondary, as it fills cracks in quartz fragments and appears to have replaced some portions of these fragments. The acid rocks are believed to be the source of the metals.

This property has been abandoned.

The workings on Claim B. G. 136 consist of a tunnel which runs horizontally not far below the surface, along a vein for a distance of about 150 feet, making a bend to the north about 100 feet from the exit. The vein is quite irregular, and is in the porphyritic granite not far from the contact with greenstone. The gangue is quartz, and carries some pyrite and a little chalcopyrite, partly altered to malachite. The quartz was dark, slightly opalescent, and does not look unfavorable, though no free gold was seen.

AL 499

On an island in North bay covered by location A.L. 499, and not far east of the last property described, Mr. T. K. Barnard has sunk a shaft and stripped a number of veins. Mr. Barnard has been on this island for seven years, and his beautiful flowers and well-kept cabin deserve special mention. It is probably the best kept and most attractive cabin owned by any prospector in the north.



Fig. 7.—Mr T. K. Barnard's camp, Sturgeon lake.

On this island there is a contact between greenstone in the form of altered diabase, green schist and quartz-porphyry, which in places becomes more like granite than quartz-porphyry, and may be regarded as a phase of the granite. The veins occur in the greenstone and schist, in the porphyry and along the contact between the two. The quartz in most of the veins is dark and favourable looking, although one vein appears barren. One of these veins runs nearly across the island. A shaft 25 feet deep and 9 x 7 feet, has been sunk on a group of one large and many smaller veins. In the shaft there is a dike-like mass of porphyry, and there is some evidence of a slip horizontally part way down the shaft, while at the bottom there is a mass of greenstone. As this greenstone is older than the vein it has not intruded it, and although the vein may have pinched here it may reappear on either side of this mass.

There are many little stringers in the quartz-porphyry, suggesting that the fissures had been developed at the time of cooling and contraction of this rock. From one of these little veins some gold was panned, and the dark quartz from the shaft also showed

fair values, but we did not find any visible gold, and the owner stated that it seldom occurred, although this property has had a local reputation for supplying unusual samples of free gold.

The Symmes Prospects

On claim B.G. 139, on the shore of North bay, there are three old camps, and near them some pits. W. G. Miller states in his report that there are two shafts on the Symmes property, which includes B.G. 138 and adjoining claims, about 25 feet apart, and that the southern one is said to be 22 feet deep and the other one 15 feet. He describes the vein as about 9 feet wide, occurring in granite, and consisting of dark quartz carrying iron pyrite, dark sphalerite, and occasionally visible gold. I could not get any definite information in the field regarding these properties, as some of the claims have been abandoned and the Coveney brothers have taken up and partially developed some of the others, which will be described under "The Coveney prospects."

Near the camps on B.G. 139 there are two pits about 100 feet apart and 7 to 10 feet deep on a large white quartz vein. The granite in which the vein lies in the upper portion of the pit as a sort of capping, is much shattered, and the vein is very irregular.



Fig. 8.—Island of quartz-porphyry in Northeast bay, Sturgeon lake.

The Coveney Prospects

On A.L. 497, a short distance from the southeast corner of B.G. 138, considerable prospecting work has been done by the Coveney brothers. They have sunk three pits, two of which lie near together, on a large irregular mass of quartz near the contact between porphyritic granite and Keewatin green schists. This mass of quartz appears to form a sort of capping from 1½ to 6 feet thick due to solutions rising from many cracks in the shattered granite and spreading out along some horizontal line of weakness, probably between the greenstone above and the granite beneath, and then exposed by the removal of the greenstone by erosive agencies. The bottoms of the pits show very little evidence of a continuous vein. Where stripped, small dikes of granite are seen cutting the schist, and numerous stringers of quartz occur in both granite and schist.

The largest pit is in the form of a trench about 50 feet long, 10 to 15 feet deep and

8 to 10 feet wide. Some of the ore taken from this pit was described by Mr. D. Coveney as containing the following assay values:

Silver	$25 per ton.
Gold	$6 "
Copper	$2 to $3 "

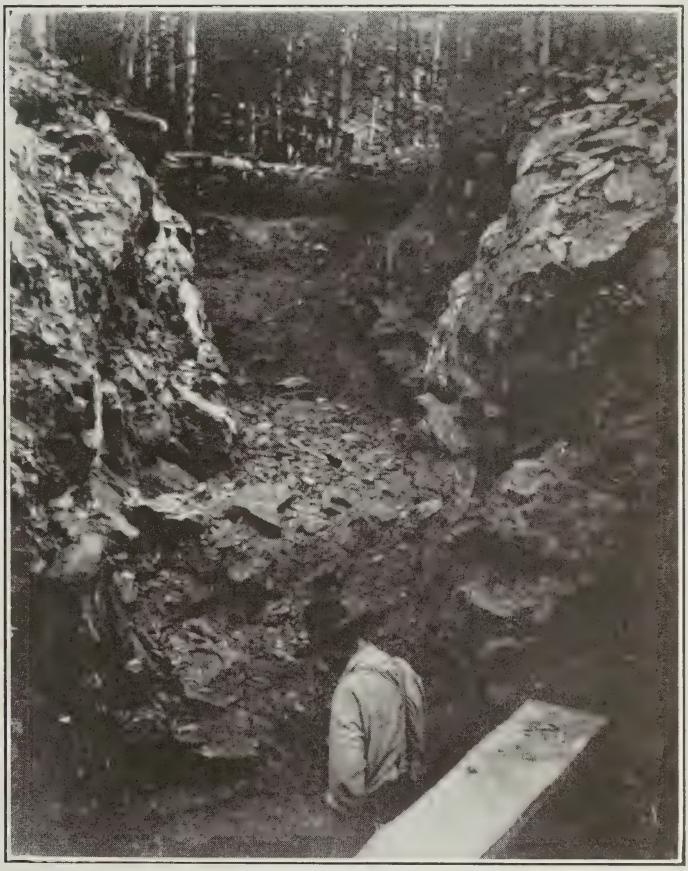


Fig. 9.—Coveney's test pit, Sturgeon lake.

One of the most highly mineralized specimens, taken by the writer and analysed by Mr. N. L. Turner, Provincial Assayer, showed the following values:

Gold	0.20 oz. ($4.00) per ton.
Silver	22.72 oz. ($11.36) "

The vein is fairly well mineralized with chalcopyrite and pyrite. The latter is sometimes in cubes one-half an inch in diameter, and in some places the pyrite has been dissolved, leaving cubic cavities in the quartz filled with iron oxide.

The contact between Sturgeon Lake granite and Keewatin schist runs nearly north and south in this vicinity, and about 100 paces south along the contact there is another pit on a large quartz vein. This pit is about 12 feet deep and varies in horizontal dimensions from 10 x 7 feet at the top to 6 x 5 feet at the bottom. There was a little water in the pit, and at the surface of the water the vein widens out to practically the



Fig. 10.—St. Anthony mine camps, Sturgeon lake.



Fig. 11.—St. Anthony mine, Sturgeon lake, showing stamp mill, power house and shaft house.

full width of the pit. The upper portion of the vein is very irregular and is mixed with bands of schist. It strikes 160°, dips 80° W., and where stripped can be traced 150 feet up the hillside, where it either pinches out or is turned off in another direction by a change in the strike of the schist, which at this point changes in strike to a northeast direction. Throughout this 150 feet it keeps its width well, and the footwall is fairly distinct.

The St. Anthony Mine

The St. Anthony mine is situated on claims B.G. 151 and 152 on the west shore of Couture lake. The camps (Fig. 10) are located on B.G. 154 and 168 on St. Anthony bay, a small indentation in the shore of North bay of Sturgeon lake. The camps, as well as some of the buildings at the mine, have been renovated during the past summer, preparatory to the carrying out of further development work at the mine.

This property, which is by far the most important one in the district, was located about ten years ago, when it was known as the Jack Lake mine. It also goes by the name of the St. Anthony Reef, because of the idea held by some that its surroundings suggested a reef rising above the water of Couture lake. It has been controlled for some time by the St. Anthony Mining Company, and was worked from the year 1903 until 1908, when it was closed down. During 1907 and 1908 Mr. J. Steele worked the mine under option. The present manager of the company is Mr. Arthur L. McEwan, to whom I am much indebted for his hospitality to us while working in the vicinity of the mine.

The buildings at the mine (Fig. 11) consist of a ten-stamp mill and amalgamation plant, boiler, engine and shaft house, carpenter shop and blacksmith shop. The sulphide concentrates from the mill have been stored pending better shipping facilities.

The general plan of the mine and the geology in its immediate vicinity is shown on the accompanying sketch map (page 147). The mine workings consist first of an open cut extending almost north and south along the main vein from Couture lake (Fig. 12). This cut is over 300 feet long and reaches a maximum depth of 40 feet and width of 25 feet. The width varies from about 10 to 25 feet, and the greater portion of the material removed was milled. In the bottom of the open cut shaft No. 3 is found, and it extends 100 feet below the surface. About 220 feet north of this shaft No. 2 has been sunk and a drift connects the two shafts, most of it lying along the vein. At the bottom of No. 2 a cross-cut runs west 30 feet to pick up the vein, and then a drift south 67 feet and another cross-cut east to the north and south drift between the shafts. A cross-cut is said to extend east 125 feet from the bottom of No. 2 shaft. The hoisting is done from this shaft, which is timbered.

From the west end of the 30-foot cross-cut from shaft No. 2 a drift runs north 180 feet to an upraise known as No. 1 shaft, and from the opening a drift is said to continue further north 160 feet. No mine maps were available at the time of my visit, and these figures are compiled from several sources.

Besides the open cut there are on the surface a number of pits as indicated on the sketch map, but none of these are very extensive. The rocks in the vicinity of the mine consist of Keewatin greenstone, schist and schistose graywacké, intruded by quartz-porphyry, and the whole intruded by the later Sturgeon Lake granite. The granite in this vicinity is porphyritic and highly altered by hydrothermal action, where chemically active waters have acted on the rocks. The main vein runs in the granite close to the contact for some distance, and then leaves the granite and extends out into the schists. There seems to be good evidence that when the granite cooled and shrunk, the adjacent rocks were broken and shifted so that a fissure could be filled with quartz and calcite. From the appearance of the walls on the sides of the open cut it looks as if the rock on the east side of the fissure moved north and that on the west side south. At the time this large fissure was formed countless smaller ones were developed, so that there is a zone about one-quarter of a mile wide, more or less streaked with quartz veins, and in places the walls of the main fissure become indistinct in the granite (Fig. 22). In the walls of the veins the granite has been so altered that most of the feldspar has

disappeared, and the rock has turned into a greenish-yellow protogine, consisting almost entirely of quartz and muscovite.

The gangue in the granite and schist is largely quartz, but some calcite occurs in both rocks and in greater proportion in the latter. Some siderite is also present where the vein cuts the schist. In the open cut in the schist, the walls are distinct, although the quartz is often distributed in narrow veins along the planes of cleavage, and the whole mass from wall to wall contained more or less gold.

The minerals in the gangue are free gold, pyrite, chalcopyrite, sphalerite and galena. Beautiful specimens of free gold have been obtained from this mine. Much of the ore is free-milling, but with depth the sulphides appear more abundantly. The ore from the schists contains less sulphides than that from the granite, and



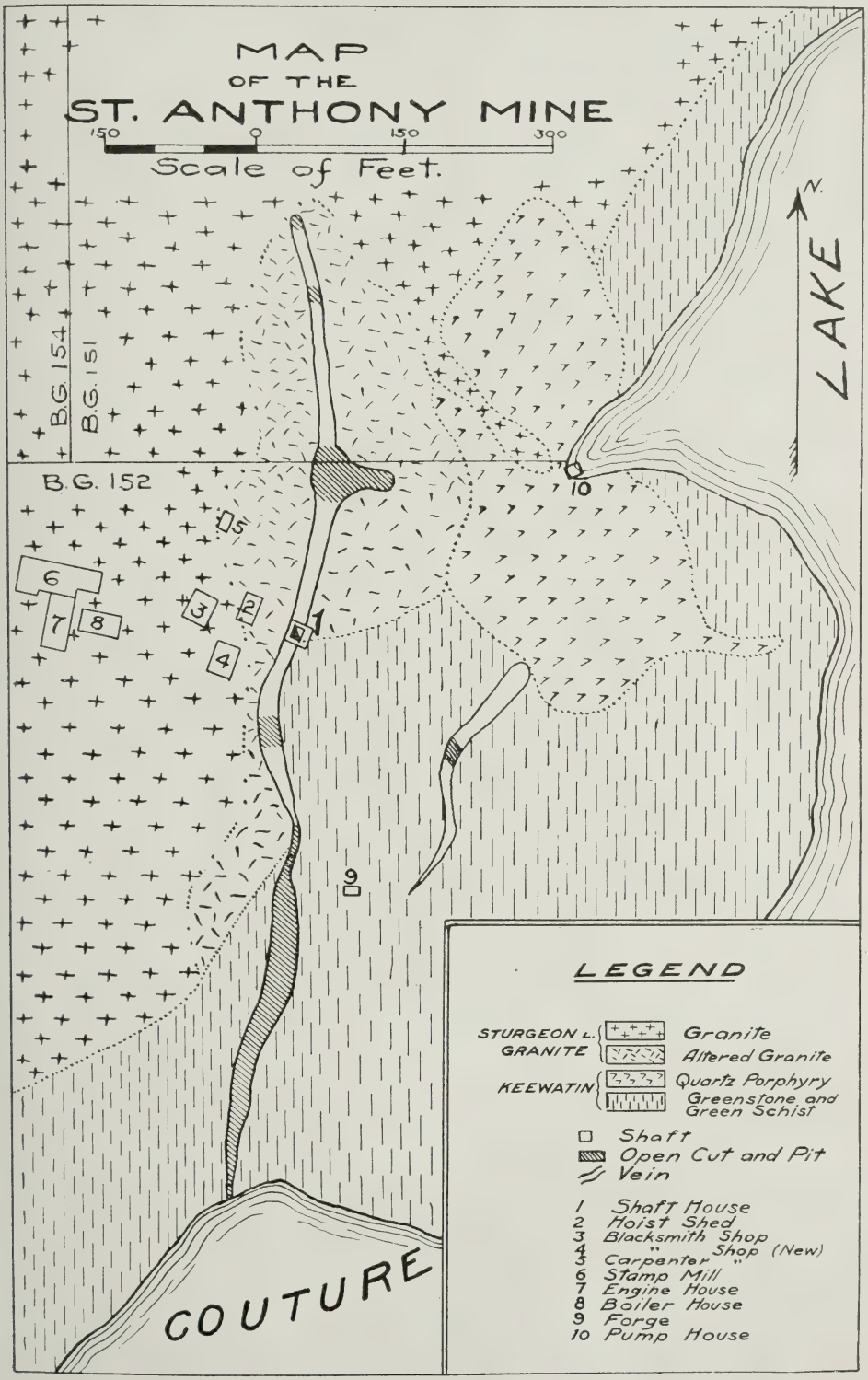
Fig. 12.—Open cut at St. Anthony mine.

this seems to be due to the greater ease with which oxidizing waters percolate the schists. The writer was informed while at the Athabasca mine, near Nelson, B.C., that similar conditions existed there where the ore occurs in porphyritic granite and schist.

No assays of the ore were made by the writer, but the manager states that much ore was mined which ran as high as $85 per ton, and that there is still in the mine a good deal of ore which will average $12 per ton. It is not unlikely that with depth the quartz veins will become less clearly defined in the granite, it being probable that most of these veins were formed in the outer and upper portion of the granite magma when it cooled, before the mass as a whole was completely solidified.

During the past summer new interest was taken in this property, and considerable work was done in the way of putting up new buildings and making a start at development work by sinking in No. 3 shaft.

This property has been described by other writers, and references are given in this report in the section on the history of the field.


MAP
OF THE
ST. ANTHONY MINE
150 0 150 300
Scale of Feet.
N.
LAKE
B.G. 154
B.G. 151
B.G. 152
COUTURE
1
2
3
4
5
6
7
8
9
10
LEGEND
STURGEON L. GRANITE
Granite
Altered Granite
KEEWATIN
Quartz Porphyry
Greenstone and Green Schist
Shaft
Open Cut and Pit
Vein
1 Shaft House
2 Hoist Shed
3 Blacksmith Shop
4 " Shop (New)
5 Carpenter "
6 Stamp Mill
7 Engine House
8 Boiler House
9 Forge
10 Pump House

The English River Gold Mining Company

On location B.G. 157 is what is known as the Dawson mine, now owned by the English River Gold Mining Company, and formerly controlled by the Sturgeon Lake Mining Company. Like the St. Anthony, it is situated near the contact between the green schists and granite, but instead of lying on the main contact, it lies on the contact between bands of schist and arkose cut by the granite. There are here a number of pegmatite dikes, in some parts composed of about half feldspar and half quartz, and in other parts consisting largely of one or the other.

The gangue is quartz, and the ore minerals found were galena, sphalerite, pyrite and chalcopyrite. Good specimens of free gold are said to have been found, though we were unable to find any on the dump.

The workings include a shaft, open cut and some pits, the former being full of water. The shaft is said to be 64 feet deep, and the open cut is about 70 feet long, 10 feet deep and 5 to 6 feet wide. Much of the country rock is included in this width.

The buildings include a mill containing ten stamps and other equipment (Fig. 13), but the mill has been long idle.

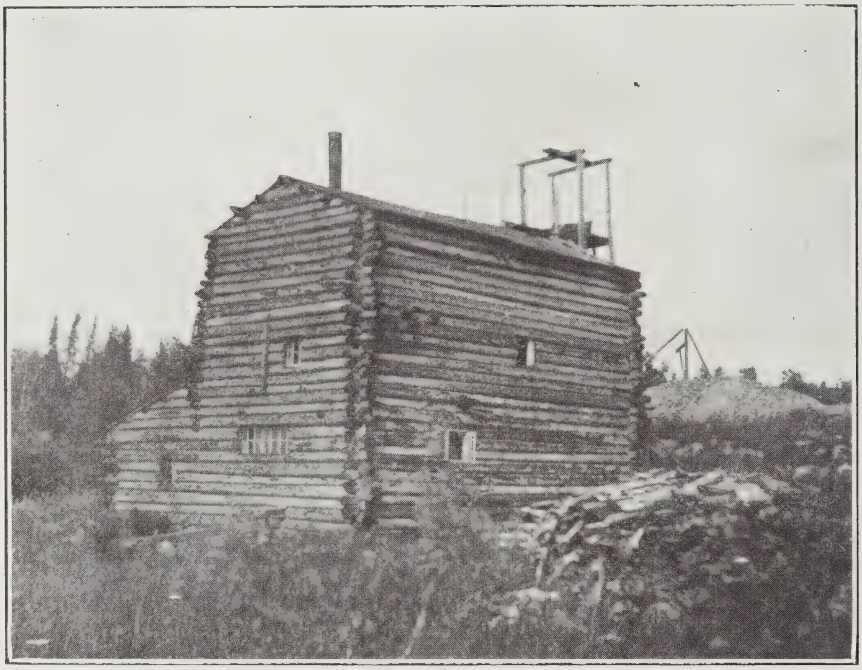


Fig. 13.—Sturgeon Lake Gold Company's stamp mill.

Other Prospects on North Bay

Besides a large number of pits, too numerous to mention individually, there are two more shafts near the east shore of North bay. One of these is on claim H.W. 704, along the contact between granite and green schist. This shaft is about 48 feet deep, and was sunk by William Lediet on an irregular quartz lode, which is made up of stringers and lenses of quartz in the schist extending the width of the shaft. The quartz and schist are impregnated with pyrite, but we did not find any visible gold.

East of claim H.W. 691, near the north end of the bay, there is a shaft about 53 feet deep on a very irregular vein of quartz and greenstone.

Just south of this shaft there is a large pit on an irregular mass of quartz. The pit disclosed quartz for a distance of 18 feet. Many smaller pits were also found in

this area, and on one of them is a vein of calcite, carrying large radiating crystals of tremolite.

On claim H.W. 697, southeast of the Dawson mine, known as the "White Prospect," there is a mass of quartz broken up by prospectors. This large mass appears to have been separated from a vein somewhere in the vicinity and was probably moved to its present position by a glacier. It is very difficult to say where the mass originated, and it seems to lie on green schist. There is swamp to the north and west. As there is a large vein whose strike would carry it through this swamp, lying about 100 paces to the southwest, it is probable that the mass of quartz has been broken from this vein a little to the north. The vein where exposed is about 15 feet wide, and consists of what appears to be barren white quartz. The broken quartz looks more favorable as a carrier of gold, and although two of us on two separate occasions spent considerable



Fig. 14.—Peter King's camp on Couture lake.

time in searching the fragments for specimens, we were unable to find any visible gold. Dr. W. G. Miller in his report on this prospect states that he had no difficulty in finding "shows of gold," and apparently the attractive specimens have all been carried away.

Prospects on Couture Lake

There are a great number of prospects in the vicinity of Couture lake, but it is possible to describe only a few of them here.

On the large island northeast of the St. Anthony there are some large quartz veins in schist. None of these have been developed, and Mr. Miller has already described them. One of these gave an assay of $2.75 per ton in gold.

On claims A.L. 656 and 657 there are a number of pits and one shaft. These are controlled by Messrs. King and Frazer. The shaft is said to be 75 feet deep. The vein of quartz and calcite is about 8 inches wide, and has a pretty distinct hanging wall. It carries some nice specimens of visible gold. The vein can be followed over a portion of two claims, and although it is largely in green schist, it is closely associated with a

narrow band of comparatively fresh-looking quartz-porphyry, in which is some of the quartz, and some of it along the contact between it and the schist. The vein shows a tendency to break up into stringers in some places, and is small, although the quartz looks favorable as a carrier of gold.

To the north of the shaft, on some claims worked by Mr. Fawcett, are a number of pits on veins which in some places show visible gold. North of these claims there are a good many pits, most of which are of no interest.

On the west side of the lake, on claim A.L. 662, there is an old shaft at least 20 feet deep, containing a good deal of water. The vein is about 2 feet wide and dips 30 degrees west. It fills a fissure between a footwall of schist and a hanging wall of altered graywacké. The vein is mineralized with chalcopyrite, galena, sphalerite, pyrite and a little pyrrhotite. A little free gold was found in some specimens of quartz believed to have come from the shaft.

Prospects around Ouillette Lake

There are a large number of prospects in the vicinity of Ouillette lake, lying north of Couture lake. Many of these consist of little pits of no importance, but the Ouillette Lake Mining Company, with headquarters at Sault Ste. Marie, Ontario, have done much prospecting work on nine claims northeast of the lake. Outside of the two old locations S.V. 421 and 422, none of the claims have been surveyed, but they adjoin on the east and south.

One pit about 25 feet long runs across a mass of schistose diorite, and the rock is cut up with stringers of quartz. The quartz carries considerable pyrite and pyrrhotite, and a number of specimens of free gold were seen.

In another pit about 15 feet long and 7 feet deep a mass of white quartz stringers about 10 feet wide may be seen lying along the hanging wall. The rock has about the composition of diorite. On the surface near this pit there is a quartz vein about 3 feet wide which may be connected with the mass already described. It pinches down to about 20 inches in a pit 10 feet deep.

On location S.V. 422 there is a pit on a large mass of quartz. The pit is about 14 feet wide, and the quartz extends almost across it.

On another claim a mass of stringers appearing on the surface unite in a pit to form a vein about 8 feet wide.

The rock in which the veins occur is largely coarse greenstone, the gangue is mostly quartz, and the other minerals in the vein chalcopyrite and pyrite. The veins in places form some of the largest in the region, and some of them carry gold, but they show a tendency to break up into small stringers or otherwise become irregular.

The Northern Light Mine

What is known as the Northern Light mine is situated on location H.W. 694, near the northern end of Northeast bay. There are a number of old camps at the lake shore and the shaft is a little over a quarter of a mile to the north. This shaft, which is timbered, was nearly full of water and its depth could not be ascertained. The vein is not exposed on the surface, so nothing could be learned beyond the fact that the quartz from the shaft varies from dark to almost pure white, and is mineralized to a small extent with pyrite and chalcopyrite. About 50 paces to the west a pit 12 feet deep exposes a vein 6 feet wide. The veins here are in schist and diorite.

This property has not been worked for some years. Last year it was restaked.

The Powell Property

On the west shore of Northeast bay, on Claim A.L. 701, there is a deposit locally known as the Powell property. Last summer it was developed for Mr. Beidelman under the management of Mr. Atwood, who was formerly with the Douglas Mining Company. The workings lie on a vein, consisting of attractive-looking quartz, beginning near the lake shore and running a little west of south. There are a number of pits, and two

of them were about 25 feet deep, but neither was timbered at the time of our visit. The rocks consist of a complicated mixture of quartz-porphyry, gray schist and greenstone, and the vein lies sometimes in one rock and sometimes in the other, and in places along the contact between the two. It varies in width from 2 to 15 inches, and frequently breaks up into stringers, especially at the contact between different types of rock. The quartz is well mineralized with pyrite and chalcopyrite, the latter frequently altered to malachite and azurite. We had no difficulty in finding good samples of gold at a depth of 20 feet. These gold specimens are doubtless due to the secondary enrichment process, as they occur in association with the secondary carbonates of copper.

Near the pits described there are a number of smaller ones on this same vein, which fingers out a little farther south.

Other Deposits on Northeast Bay

On the long point running south, just west of the island covered by S.V. 414, Mr. George Day has staked a number of claims which have not yet been surveyed. On these claims there are some pits on irregular quartz veins in quartz porphyry and along the contact between the quartz porphyry and green schist. The quartz is often disseminated in the porphyry, and appears in places like veins filling cracks in a partially cooled molten mass, though the veins may be later impregnations by hot solutions along lines of weakness. The rock is usually much decomposed along the veins, while the veins and rocks, especially near the fissures, are impregnated with iron pyrite, in some places with cubes one-quarter inch in diameter. In one place a beautiful specimen of gold was seen in a space left by the removal of one of these cubes, and in the oxidized and decomposed rock free gold could be found by panning. Gold in any quantity seems to be limited largely to the upper portion of the deposits which have been oxidized, and it seems probable that a considerable amount of the quartz may have been collected into these veins by the partial decomposition of the surrounding rocks and the segregation of the quartz under the action of organic acids. The organic acids, no doubt, have had a good deal of influence in dissolving and concentrating the gold which would be freed from mechanical union with the pyrite by the oxidation and removal of the pyrite in the form of ferrous sulphate.

Many other small deposits occur in Northeast bay, but they seem much alike and too numerous for description.

Prospects on Belmore Bay

Since the year 1906 the region around Belmore bay has attracted considerable attention, as there are many veins within about three miles of the lake. The Douglas Mining Company have camps on the east shore of the bay and have sunk a couple of shafts (Fig. 15). On claim P. 7 there is a shaft said to be 22 feet deep on a vein varying in width from 3 inches to 2 feet. A test-pit near by shows stringers running through the schist. On the same claim and 98 paces distant from the 22-foot shaft there is another one 73 feet deep on the same vein. The rock from the bottom of the shaft consists of gray to white quartz scattered through schist and mineralized with chalcopyrite and pyrite.

There seems to be little galena or zinc blende in this region, and the same can be said of the deposits on the northern part of Northeast bay, while around Couture lake and North bay these minerals seem to be more common.

On what is called the Ruby property owned by the Douglas Mining Company there is a shaft said to be 30 feet deep on a mass of quartz stringers about 4 feet wide, in dark greenstones varying in composition from diabase to diorite. North of this shaft 100 feet and on the same vein is a pit about 22 feet deep where the vein varies in width from 3 inches to 2 feet. The veins run in a general northeast direction with the strike of the rock and with a dip 60 degrees northwest.

The gangue here is quartz of good quality and calcite. It contains pyrite and chalcopyrite, and specimens of free gold were seen in calcite and quartz.



Fig. 15.—Douglas Mining Company's camp, Belmore bay, Sturgeon lake.



Fig. 16.—Belmore Bay Mining Company, stamp mill, 1909.

The other company which has done much work in the vicinity of Belmore bay is the Belmore Bay Mining Company, which owns a number of claims just east of the lake. It is said that the shaft near Mud lake, where the camps are situated, is 260 feet deep, and very little ore came out of it. A three-stamp mill has been erected on the shore of the lake, but it did not run long. (Fig. 16.)

Besides the properties described, there are many prospects unnecessary to mention, as most of them are pits on small veins or stringers and a description of one serves for almost all. The rocks in the area are mostly coarse greenstones, not as a rule very schistose, syenite porphyries, quartz porphyries, rhyolite tuffs, and plagioclase porphyries with very large phenocrysts sometimes an inch in diameter. The veins are as a rule very irregular, frequently breaking up into stringers, pinching out or expanding to form masses several feet in width. The metallic minerals are predominantly chalcopyrite and pyrite, with considerable pyrolusite in some places.

Free gold was seen only on a few claims. Some of the veins are associated with aplite and felsite dikes. In one case an aplite dike cuts a syenite porphyry, and near it there are crystals of ilmenite. The rock has been brecciated, and the cracks filled with calcite, carrying chalcopyrite and pyrite. The ilmenite may have been developed as a contact metamorphic mineral.

On Morgan island, just west of Belmore bay, is a mass of rhyolite tuff in places, impregnated, especially near its contact with quartz porphyry, with calcium and iron carbonates, which are mineralized with copper and iron pyrites and galena. The tuff, in a band about 100 feet wide, is composed of angular fragments of rhyolite, and the whole mass is reddened by the alteration of the iron-bearing minerals. This deposit has not been found to carry gold to any extent.

On East bay are a number of abandoned prospects, and on the east side of the narrows about five miles below Sturgeon lake hotel there is a pit on a vein of calcite. Associated with the vein there are besides calcite, apatite, tourmaline, hornblende, zircon, pyrite and chalcopyrite and, it is said, values in silver.

As there are in the Sturgeon Lake Gold field hundreds of pits, many of them of no importance and the majority of them having characters in common, it is impossible to describe them all, and it may be that some left unmentioned are as important as some of those described. An attempt has been made to indicate on the accompanying map the shafts and many of the pits, but many pits and strippings have necessarily been omitted, as it would require too much detail to plot all of them.

Economic Possibilities of the Sturgeon Lake Gold Field

Having spent considerable time in studying this field it might be well for the writer to express, from a geological standpoint, his opinions regarding its future.

A study of the region shows that gold is widely distributed, and that one can locate a vein, small or large, in many parts of the area. These veins are, however, as a rule, very irregular and uncertain, not having been formed by any widespread movements which opened extensive fissures, but rather by cooling and shrinking of igneous rocks and slight movements along contacts and cleavage planes. The fissure at the St. Anthony is the only one which can be regarded as an important exception to this rule, and it is the only deposit which has given promise of really making a mine.

While this area has been remarkable for the large number of fine specimens of free gold, these have been the products of secondary enrichment and concentration, and are not likely to continue to great depths. With the absence of much free gold at depth, few of the veins show a sufficient increase in the sulphide ores to counterbalance the diminution of the free gold. As the region has for so long been exposed to erosive agencies, it is probable that much material from the upper portions of the veins has disappeared, and with it considerable gold. The low relief and the scarcity of streams are also against the possibility of valuable placers being found.

Much unprofitable work has been done in the area, partly because many of the prospectors lacked experience, and partly because, as already mentioned in this report,

some men having charge of the work were doing it at the expense of others. While there are plenty of veins in the region, many mere stringers of quartz have been exploited without any justification, largely because the region is easily accessible and an attractive one in which to work. In the future those who wish to carry on proper exploratory work should profit by the experience of most of the other companies which have operated in the region, and not build stamp mills before they have enough ore in sight to justify such an expense.

Petrography

This section of the report is devoted to detailed descriptions of some of the most interesting rocks of the Sturgeon Lake field and these are given for their scientific rather than economic interest.

Greenstones and Schists

The greenstones of the area comprise a great assortment, among which are many altered diabases, diorites, gabbros and porphyries of basic composition. These porphyries in places show phenocrysts of plagioclase feldspar which are of unusual dimensions. In one specimen the feldspars were somewhat elongated by pressure and one phenocryst measured 2½ inches by 1½ inches; another was 3 inches long and 1 inch wide. The surface of the feldspar shows a pink color due to alteration. Under the microscope the rock is found to be so completely altered to chlorite, uralite, calcite and kaolin that no sharp line marks the boundary of the feldspar crystals. Although many specimens were found which showed large phenocrysts, the dimensions given above represent the largest.

Agglomerates and Breccias

A few patches of these rocks are indicated on the accompanying map. It is hard to distinguish some of them from conglomerates, since they have become schistose. Some of these breccias show rounded and somewhat spherule-like masses of greenstone, which may be due to the rolling and breaking of lava when flowing and cooling, and they may be flow-breccias. Other types seem to be crush-breccias, as angular fragments of a quartz porphyry and rhyolite occur in a matrix which the microscope shows to be composed not of sedimentary material, but of the same igneous rock in a schistose and fractured condition.

Quartz Porphyries and Related Rocks

This group includes a series of fine-grained and porphyritic acid rocks consisting of rhyolites and alkali-feldspar porphyries, with some of their metamorphic equivalents. Most of them are very monotonous types for study. These rocks are supposed to be all more or less intimately related, and to belong to the same petrographic province. One item of interest was the presence of blue quartz grains near the contact between the quartz-porphyry and greenstones, and as stated in a discussion on this phenomenon in a report on the Tip Top copper mine, found in another part of this volume, these are believed to be due to contact action. The color seems to be caused by a large number of very small mineral inclusions in the quartz which are in diameter less than one-half a wave length of light. A specimen of rock taken at the Tip Top mine showed grains of blue and colorless quartz, and under the microscope the blue grains were found to contain many more inclusions than the colorless grains. The blue grains invariably have an opalescent appearance, and it is probable that they contain some water of crystallization. It is also probable that sudden cooling may have prevented the full development of the phanerocrystalline texture, and caused the cryptocrystalline texture to be assumed and with it a rounded grain instead of a crystal with distinct outline.

There are some fine grained gray biotite-gneisses and schists in this area, which are similar to those described in the Lake Savant Iron Range Area as probably equivalent to Lawson's Couchiching.[10] These rocks can be found grading into the fine

[10] Bur. Min., Vol. XIX. (1910), pp. 183-4.

grained acid igneous rocks, and are believed to be formed in most cases by the shearing of the latter and in other cases from the sheared weathered products.

The presence of much pyrite in portions of these acid igneous rocks is a characteristic feature. This pyrite often appears to be pyrogenetic, but in many other cases it is found only along cracks in such a way as to suggest an extraneous source.

Hornblende Syenites

Lying along the eastern shore of the upper portion of the narrows on the lake, there is a large mass of rock which in appearance much resembles a light colored gabbro and has been mapped as gabbro on the Canadian Geological Survey's map. It appears much darker in some parts than in others, but in all the specimens examined the feldspars appear to be of the potash species, and one section showed a very little quartz, so that the rock is a syenite. It has much the appearance of some nephelite syenites though microscopic observations failed to show the presence of any nephelite.

The megascopic characters of the rock are a gray color, phanerocrystalline texture, crystals of pyrite, hornblende and good cleavage faces of feldspar resembling plagioclase, but lacking any sign of striations due to twinning.

Under the microscope one section is composed of the following minerals: Orthoclase, microcline, green hornblende, a little biotite and a small quantity of mica the pleochroism of which would identify it as zinnwaldite. The relation of this mica to the other minerals suggests that it has been introduced into the rock from an external source. Titanite in prismatic form and in acute rhombic sections is fairly common, and small crystals of it are frequently enclosed in the crystals of hornblende. A considerable amount of topaz is present and it shows as a colorless, slightly higher bi-refringent mineral than quartz, filling spaces between the feldspars and in places appears to have replaced portions of these minerals. Fluorite varying in color from blue, violet to colorless is quite common. It occurs in some cases as irregular streaks, but also as little cubes. It is found as small crystals in orthoclase, fills holes in topaz, and occupies cracks in the other minerals or the interstices between various crystals. Apatite is found in small crystals, and pyrite and magnetite in small quantity. Other thin sections show orthoclase, microcline, green hornblende, a little albite, small crystals of augite, apatite, a little tourmaline, considerable titanite, calcite, fluorite, topaz and a small proportion of quartz.

As mentioned in a previous section a pit in the syenite reveals a calcite vein with which are associated apatite, tourmaline, hornblende, zircon, pyrite and chalcopyrite.

In the presence of so many fluorine, boron, and titanium minerals we have good evidence of rather extensive fumarole action. On the cooling of the magma, fracturing on a small scale must have occurred and permitted the boron and fluorine gases to rise through the rock and replace some of the other minerals by new minerals. The quartz and calcite veins would be due to solutions filling some of these cracks.

On account of certain petrographic similarities between them it seems probable that these syenites belong to the same petrographic province as the granites a little farther north, but represent a more basic phase of the parent magma.

Quartz and Calcite Veins

In the quartz and calcite veins of the area there are two interesting mineralogical occurrences. A small calcite vein cutting greenstone on a claim a short distance east of the north end of North bay is full of radiating aggregates of tremolite crystals. The crystals are in sheaf-like bunches, are greenish gray in color and some of them as much as 2½ inches in length. They have a columnar form, furrowed faces and good cleavage. In the calcite there is a little quartz vein with fine needles of greenish actinolite. A somewhat banded arrangement of the materials in the vein suggests that cracks were formed in the calcite, along which the quartz was deposited and the actinolite and tremolite developed by metamorphism.

In a quartz vein from the vicinity of Belmore bay there is siderite, and in the quartz some very thin needles about ¼ inch in length which are considered to be crystals of rutile.

Sturgeon Lake Granite

From the petrographic standpoint the granites in the Sturgeon lake region are the most interesting the writer has met in the northern fields. The special features in these rocks are the porphyritic texture and the graduations from porphyritic granite to quartz-porphyry, the hydrothermal alteration which they have suffered and the differentiation which may have produced a series of dikes found cutting the granite. The question whether these dikes may be regarded in all cases as simply a later phase of the magma which formed the rocks they cut, or as a distinctly later granite, is difficult to decide, as some of them certainly appear to be of pegmatitic and aplitic character.



Fig. 17.—Inclusions of greenstone in granite, where the former has been brecciated by the latter.

Beginning on the northwestern part of North bay just below Trapper's Cabin, specimen 312 was taken from a medium coarse grained, very light colored granite dike, which under the microscope was found to be a biotite granite consisting of a large amount of quartz, some biotite and feldspar which is chiefly albite or the zonally-built sodium-calcium variety. In composition it is high in soda, and much like that of some of the porphyritic granite farther east. Specimen 313 is from a clear cut dike of very acid granite intruding a dark very fine-grained biotite gneiss. The dike consists chiefly of quartz and orthoclase, and is much more acid than the gneiss. Another specimen (No. 316) is from a dike 1½ inches wide, consisting of fine grained granite cutting a gneiss containing much biotite. Under the microscope the dike in places shows clear cut edges and in other places they are indistinct. The proportions of feldspar and quartz are almost the same in the dike and gneiss, and they have both suffered about equally from alteration.

The observations made on these rocks in some cases suggest gneiss and dikes of two distinct ages, while other observations seem to point to the gradation from the condition mentioned to those in which enclosing granite is not gneissic. The contacts between the dikes and enclosing rocks are not distinctly marked off, and the dikes have all the characters of pegmatites. On "Gull Rock," a bare granite island in North bay, a coarse grained biotite granite is cut by a small dike of fine grained granite without distinct walls, and the cooling of the dike does not seem to have been much influenced by the surrounding rocks. The coarse granite is porphyritic and highly sodic in composition, as the large feldspars are mostly albite and the zonally-built sodium-calcium variety. The feldspars are more typical of a granodiorite than a granite, but there is much quartz. As in most of the granite in this region there is much epidote derived chiefly from alteration of the feldspars.

On King's bay there is a good example of the transition from porphyritic granite to quartz porphyry, and it was found that there was a good deal of quartz porphyry in the Sturgeon lake field which was of the same age and developed as a phase of the granite under the influence of the contact of the granite and greenstone or schist. Three specimens were taken (Nos. 323, 325, 326), which show quartz porphyry and granite porphyry, while near by was porphyritic granite.

In the granite porphyry the ground mass is fine grained but holocrystalline, and consists of orthoclase, quartz, epidote, muscovite and chlorite. In it are large phenocrysts of feldspar and a few of quartz and biotite. The feldspars are mostly albite or zonally-built sodium-calcium feldspars, so the granite is of a basic type. The quartz phenocrysts show some unusual examples of re-absorption by the groundmass.

It is observed that the porphyritic portions of the Sturgeon lake granite are confined largely to the vicinity of the contact with the Keewatin greenstone, and it is found also that the porphyritic portion is on the whole of a more basic type, as regards the composition of the feldspars, than the other part of the rock. This composition often approaches a granodiorite. It is possible that this difference in composition may be due, in part at least, to the absorption of much of the basic greenstone. There seems to be good evidence of the action of "stoping" in the vicinity of the contact around the St. Anthony mine where so many fragments of greenstone have been included in the granite (Fig. 17). Although many of these fragments show almost no sign of the action of the hot granite upon them outside of the development of actinolite at the edges, since they are angular and the edges are not rounded, many others must have been included more deeply in the hotter portion of the magma and been melted.

GOLD FIELDS OF LAKE OF THE WOODS, MANITOU AND DRYDEN

BY ARTHUR L. PARSONS

Introduction

In accordance with instructions received from Mr. Thomas W. Gibson, Deputy Minister of Mines, the writer left Toronto on May 7th, 1910, by the Canadian Pacific railway, for Kenora, to report on the gold mines of the Lake of the Woods, Manitou, and Dryden areas, and to make such further geological investigation of the region as could be accomplished in the field season. Mr. Ellis Thomson, of Toronto, acted as assistant throughout the season, paying particular attention to topographic work while at the same time making geological observations, and his services were of the highest value. During the month of May Mr. H. K. Slater, of the Mysore Geological Survey, accompanied the party as a guest, giving many valuable suggestions concerning the relations of the rocks.

In this report petrographic detail has been avoided, and, so far as possible, only those terms are used in designating the rocks as are employed in the reports of Dr. Lawson. In preparing the maps, the effort has been made to make the determining factor of classification depend upon the appearance in the field rather than upon the finer petrographic distinctions to be made in the laboratory, but in a few cases where the line of distinction could not easily be drawn in the field, the result of microscopic examination has been incorporated. The maps for the report have been prepared by Mr. Thomson.

Lake of the Woods and Shoal Lake

The geology of Lake of the Woods and Shoal lake has been worked out in detail by Doctor A. C. Lawson[1] and slight additions have been made by Doctor A. P. Coleman.[2] Minor changes will undoubtedly be made in the mapping of the rocks of this region as the result of detailed work. In the work of the past season a few such alterations have been made, and these will be noted in the discussion of the rocks in the regions affected. At this place I wish to express my high appreciation of the map by Dr. Lawson. When it is remembered that at the time this map was prepared very little of the country was cleared and practically no mining development had been done, the accuracy of the work is remarkable.

The work of our party in this region was almost entirely upon the Keewatin rocks, though some outcrops of the Laurentian formation were visited. The Keewatin series as described by Lawson consists of four principal types of rock formation.

(*a*) Hydromicaceous schists[3] and nacreous schists, with some associated chloritic schists and micaceous schist and altered quartz porphyry.

(*b*) Clay slate, mica schist and quartzite with some fine grained gneiss.

(*c*) Agglomerates and other coarse clastic rocks, all more or less schistose and generally of volcanic origin.

(*d*) Hornblende schists and altered traps, with some chlorite schists of volcanic origin.[4]

Diabasic Schists

The rock series having the widest distribution in this region is the last one given, which consists principally of diabase altered in many places to hornblende and chlorite schists. Several theories have been advanced to account for the formation of these and similar schists. Lawson, in mentioning the hornblende schists, states "These are first, a very hard and tough, compact, fine grained black rock, with scarcely any

[1] Lawson, A. C., Report on the Geology of the Lake of the Woods Region, Geol. Sur. Ann. Rep., 1885, Part CC.

[2] Bur. Min., Vol. VI. (1896), Map accompanying the Report, also page 106, same report.

[3] Sericite-schists.

[4] In 1904 a committee composed of geologists from Canada and the United States visited the Lake of the Woods Region and reported as follows: (Journal of Geology, Vol. 13, p. 95.)

definite schistose structure perceptible in it. Secondly, they occur as rocks differing from the last only in having a well defined slaty or schistose structure developed in them. These are also, perhaps, a little coarser grained, and as a consequence of the schistose structure are not nearly so tough under the hammer. This slaty or evenly schistose black hornblende-rock is usually the basal formation of the Keewatin series and lies in contact with the granitoid gneisses."[5] In speaking of the diabases and diorites, the same author says:

"Intimately associated with the schistose hornblende rocks are great masses of dioritic and diabasic rocks, both schistose and massive. These rocks are for the most part interbedded with the hornblende-schists, sometimes regularly and at others in short non-continuous masses, such as might be expected as the condition of occurrence of ancient flows. For purposes of mapping, it is impossible in the wild and uncleared state of the country to separate these diorites and diabases from the hornblende-schists into which, indeed, they seem at times to merge by gradations that make any attempt at a hard boundary quite out of keeping with the natural conditions."[6]

In discussing this series of rocks as found in the Rainy lake region, Dr. Coleman differentiates the diabases and schists, and also mentions intermediate rocks known as porphyrites. He states:

The bulk of the lower basic portion of the Keewatin is formed of massive rocks, chiefly diabases, more rarely gabbros, sometimes apparently diorites. Many of them are excessively weathered, the felspars turned into an aggregate of epidote, zoisite, etc., and the augite into secondary hornblende or into chlorite and carbonates. In many cases too they have undergone shearing or crushing forces, so that all gradations may be found between massive, tolerably fresh diabase and aggregates of decomposition products that retain hardly a trace of the original structure of the rock. . . . The schistose members of the basic Keewatin are often interbedded with massive sheets of altered eruptives, and are hard to separate from the more crushed and altered ones. They consist chiefly of hornblende schists near the contact with the Laurentian, ... but in other localities of chlorite schists.

It need hardly be said that transitions between hornblende and chlorite schists are numerous. There are also paler green schists . . . largely charged with epidote and zoisite, forming links to a set of hard, compact, pale green rocks showing little or no trace of schistose structure and consisting chiefly of epidote and zoisite, usually with some quartz and chlorite. The latter may perhaps be called saussurite rocks, the result probably of the weathering of a basic feldspathic ash.[7]

The general character of these rocks is well exhibited in the railway cut at Kenora station and along the road going north from this point. This series has also been described by Dr. Lawson.[8]

"In the Lake of the Woods area one main section was made from Falcon Island to Rat Portage, with various traverses to the east and west of the line of section. The section was not altogether continuous, but a number of representatives of each formation mapped by Lawson were visited. We found Lawson's descriptions to be substantially correct. We were unable to find any belts of undoubted sedimentary slate of considerable magnitude. At one or two localities subordinate belts of slate which appeared to be ordinary sediment, and one belt of black slate which is certainly sediment, are found. In short, the materials which we could recognize as water-deposited sediments are small in volume. Many of the slaty phases of rocks seemed to be no more than the metamorphosed ellipsoidal greenstones and tuffs, but some of them may be altered felsite. However, we do not assert that larger areas may not be sedimentary in the sense of being deposited under water. Aside from the belts mapped as slate, there are great areas of what Lawson calls agglomerate. These belts, mapped as agglomerates, seem to us to be largely tuff deposits, but also include extensive areas of ellipsoidal greenstones. At a number of places, associated and interstratified with the slaty phases, are narrow bands of ferruginous and siliceous dolomite. For the most part the bands are less than a foot in thickness, and no band was seen as wide as three feet, but the aggregate thickness of a number of bands at one locality would amount to several feet.

"We could discover no structural breaks between the above formations of the Lake of the Woods. The various classes of materials—slates, agglomerate and ellipsoidal greenstones—all seem to belong together. In short, these rocks in the Lake of the Woods seem to us to constitute one series which is very largely igneous or volcanic in origin, but does, as above mentioned, contain some sediments. This series in the Lake of the Woods area is the one for which the term 'Keewatin' was first proposed for the greenstone series, Lawson giving as one reason for proposing this name the statement that there is no evidence that these rocks are equivalent with the rocks of Lake Huron described by Logan and Murray as Huronian."

[5] Lawson, A. C., Geol. Sur. Can., Ann. Rep., 1885, CC, 37.

[6] Ibid., p. 41.

[7] Coleman, A. P., Bur. Min., Vol. IV, 1894, pp. 83-87.

[8] Lawson, A. C., Geol. Sur. Can., Ann. Rep., 1885, CC, 116.

From an economic point of view the hornblende schists and altered traps are probably the most important rocks found in this region, inasmuch as nearly all the better gold mining properties are located in them or in granite near its contact with these rocks. Such mines as the Sultana, Ophir, Regina, Mikado, Olympia and others may be cited as examples of such occurrences.

Agglomerates

Closely associated with the hornblende schists and altered traps is a series of apparently fragmental rocks to which Lawson assigned the name Agglomerate.[9] These rocks are apparently of several kinds, and in some cases at least seem to have included diabase and hornblende schists in which anastomosing chlorite veins have been developed. In other cases, the rock is apparently made up of fragments of rock which usually have an angular outline and may be assumed to be breccias. In one particular case on Ptarmigan bay a well defined agglomerate was found which consisted of fragments of at least two kinds of rock. It was noted, however, that even in these fragments schistosity had developed parallel to the general direction of schistose parting of the rocks of the region. In the case just mentioned the rocks appear to be of a more acid character than the altered traps, and the general appearance of the surface produced by splitting the rock is hardly distinguishable from that of those rocks which have been called by Lawson hydromica schists, but which might possibly be better called sericite schists.

In some cases it is probable that these so-called agglomerates include areas of volcanic ash, but the writer was unable to positively identify such origin for any of the rocks which came under his observation.

Hydromica Schists

Under this heading is grouped a series of schists which includes sericite schists, nacreous or talcose schists, occasional chloritic schists and altered quartz porphyries. As a rule these rocks are light colored and split very evenly into very thin platy fragments. A study of them seems to indicate that the sericite schist results principally from the alteration of quartz porphyry, and we get a series ranging in texture from an almost unaltered quartz porphyry through the following stages:—Brecciated quartz porphyry, agglomerate schists and sericite schists. Nearly all of these phases are shown in the region around Gold Rock, but so far as noted only the last two mentioned were found in the Lake of the Woods region.

Clay Slate

The clay slates and quartzites have been described by Dr. Lawson as occurring in the Lake of the Woods and on Shoal lake, but although the writer visited two localities where these are mapped he found nothing which would be definitely called a slate. In one case, however, on the north side of Shoal lake a banded quartzitic rock was noted very similar in appearance to the rocks of the iron formation, and it is possible that these rocks should be correlated.

Granites

On both Lake of the Woods and Shoal lake are to be found extensive deposits of granite and a fine grained rock which has the same composition as granite, but is so compact in texture that the minerals which compose it cannot be distinguished with the naked eye. This fine grained rock is called felsite, but for the purposes of mapping, both this rock and the granite are included under the one heading. The granite areas most important at the present time are those on Bag bay, Shoal lake; Regina bay, Lake of the Woods; and possibly the granitoid rock at the Sultana mine which has been classed as Laurentian. The importance of these lies in the fact that gold-bearing veins have been found intersecting them. It is very probable that in the vicinity of other granitic outcrops gold veins will be found either in the granite or in the hornblende schists adjoining it.

[9] Lawson, A. C., Geol. Sur. Can., Ann. Rep., 1885, CC, 49.

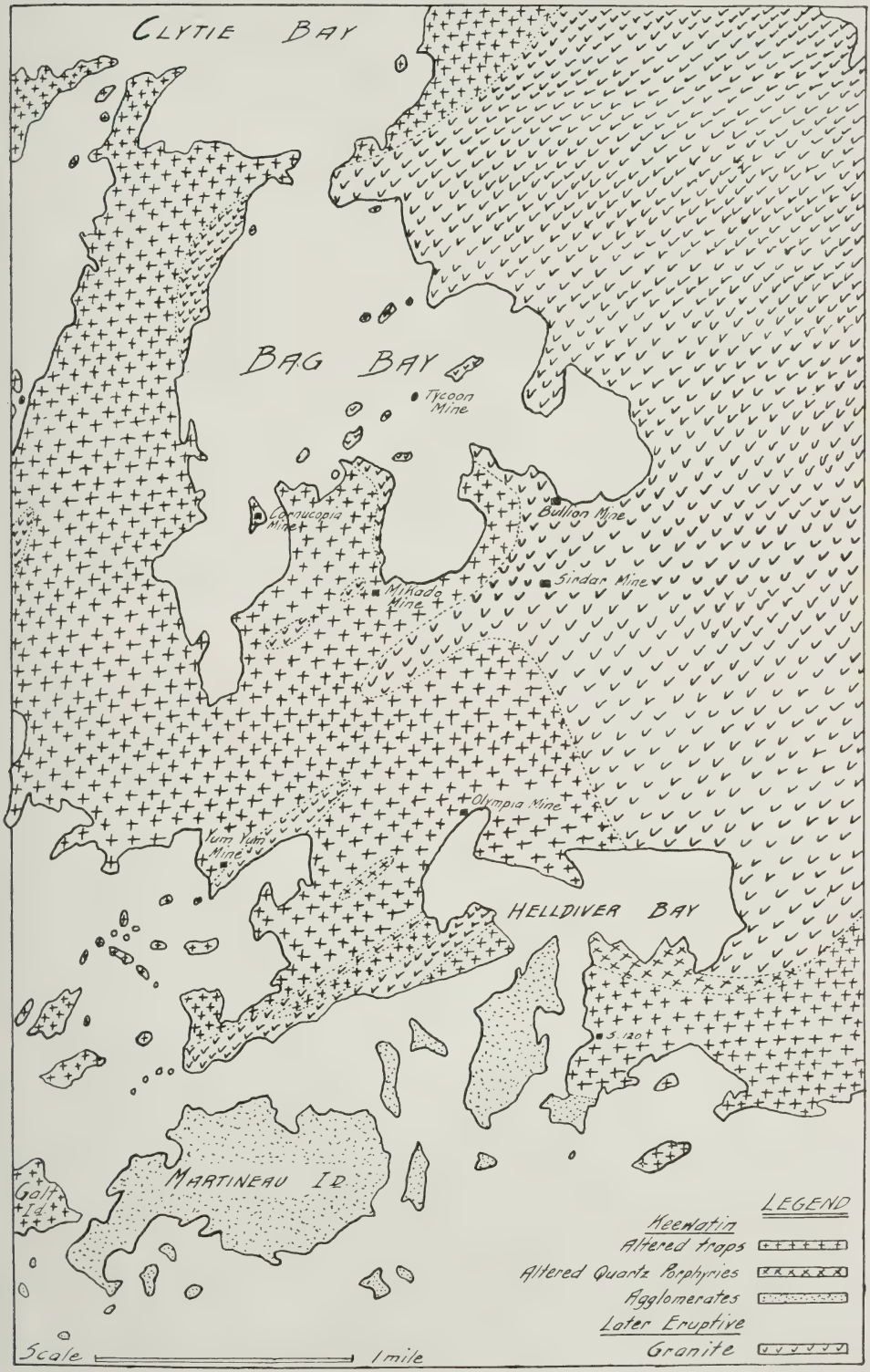


Plate No. 1. Gold mining region of Western Shoal lake.

Physical Features

The region around Lake of the Woods and Shoal lake is in general well wooded, the forest consisting principally of spruce, balsam, Norway pine, some white pine, jack pine, birch, and poplar. The country round the northern part of Lake of the Woods where rock is not present in usually covered with sand or a sandy loam. The rocks give a rugged aspect to the scenery, but although much of the rock is precipitous near the shore of the lake, the elevation of the hills will seldom be found to be more than 250 feet above the lake level, and in most cases not more than 50 to 100 feet. In general, the form of the rocks may be said to be rounded, giving what is known as *rôches moutonnées*. This appearance is undoubtedly due to glaciation, though in some cases it is difficult to comprehend how the rocks could have been affected by this agency. The lakes themselves, particularly in the northern part, have great numbers of islands, some of them several square miles in area. The presence of these islands and of rocks which come near the surface makes these lakes difficult for navigation. In general it may be said that both lakes are shallow, and in the case of Shoal lake the name indicates the fact.

Gold Area of Western Shoal Lake

Location S. 120

On the east side of the entrance to Helldiver bay is a claim upon which a two-stamp mill was about to be erected. The prospecting has been done by Mr. Andrew Johnson, and as a result of pannings and assays it was deemed advisable to put up the mill for the purpose of thoroughly proving the value of the property. We accompanied Mr. Johnson, who at the time was in charge of the Mikado property, to his claim, and by panning found a fair showing of gold in three veins.

In examining this claim and the east end of Helldiver bay it was found that the granite extends farther than is indicated on the map. Instead of stopping at the northeast corner of the bay it extends to the southeast corner; and from that point west to the mouth of the bay the rock is principally altered felsite or quartz porphyry, which develops a schistose structure. These corrections are shown on the accompanying map. See Plate No. 1.

Olympia Mine

On the northwest arm of Helldiver bay of Shoal lake is located the property known as the Olympia mine. A shaft about seventy-five feet deep has been sunk here, and a tunnel driven to intersect the shaft. At this first shaft the vein is about 3½ feet wide on the surface, but where the tunnel intersects the shaft the width is about six feet and it shows considerable variation in the shaft. The vein material is chiefly quartz, although considerable calcite is present. The walls of the vein are well defined and schistose, but a short distance away the rock is apparently unaltered diabase.

Several test pits have been sunk on this property, and a tunnel about 400 feet long has been driven along one of the veins. A fully equipped 10-stamp mill has been erected on the premises, but at the time of my visit it was idle. The mine is in charge of Mr. J. Hubner.

Yum Yum Property

The Yum Yum mine is located on the shore of Shoal lake, about a mile and a half west from the Olympia mine. At the shaft the rock is diabase, but at the old camp it is a fine grained felsite similar to the felsite at the Mikado shaft. The diabase at the shaft has developed schistosity parallel to the vein, which is about two feet wide on the surface, but pinches out about 15 feet below the surface. Considerable work was done here and the dump would indicate that the shaft had been sunk from 150 to 200 feet. Near the shaft an open cut was driven along the vein, but the work seems to have been thrown away as the vein pinched out. At several places in the woods to the southwest we were shown outcrops of a vein which appears to be a continuation of the one exposed in the open cut.



Fig. 1.—Olympia Mine.



Fig. 2.—Diabase with granite intrusions.

Mikado Mine

This mine is located on the south shore of Bag bay, Shoal lake, about 45 miles from Kenora by the steamboat route, but about 35 miles by the winter route. The geological features of the country immediately about the mine are indicated on the map accompanying this report (See plate No. 1). At the mouth of the shaft is an outcrop of felsite and granite which have been intruded in trap rock. This trap has to a large extent been altered so as to form hornblende and chlorite schists. The vein cuts across the granite and extends into the trap on both sides of the granite intrusion, so that it may be looked upon as a fissure vein. The vein consists of quartz which in places is divded into bands by thin seams of chlorite, sericite or talc. On the first visit to the mine in May, the writer examined the first three levels and found that the vein averages about four feet wide. Associated with the quartz in the vein, the following minerals are found in greater or less abundance; pyrite, chalcopyrite, bismuthinite, molybdenite, and malachite. In addition to these, free gold is found and at times the specimens are extremely rich. Near the north end of the third level the writer found specimens which showed free gold.

It is estimated that about five hundred thousand dollars' worth of gold has been taken from the Mikado, but it is said much ore of high grade was stolen and for this and other reasons it is impossible to form a correct estimate of the production. This mine, however, was one of the three or four principal producing mines of the Lake of the Woods region in the late nineties. The discovery was made about 1893 by an Indian who brought samples to Mr. Chas. Bunn, manager of the Hudson's Bay Company's store at Kenora. The specimens were so promising that Mr. Bunn and Dr. S. S. Scovil, of Kenora, took up the location and had mining work started. Later they sold the mine to Col. Engledue of London, England, and his associates, and mining operations were carried on for several years until, in 1903, the property was shut down indefinitely.

During the past year Mr. H. A. C. Machin, M.P.P., has had the mine pumped out to the fourth level and an examination made by R. B. Nickerson, M.E., who made assays of the ore in the first four levels, from the dumps and from the pile of tailings. The result of this examination was such that a company called the Kenora Mines, Limited, was formed to take over the property, and work was started in July with Mr. Nickerson as general manager.

Preparatory to regular mining operations, the plant has been remodelled, and at the time of our second visit in the latter part of August most of this work was completed, except the installation of the new cyanide plant. The foundations for this plant were being installed but the equipment had not yet arrived. The shaft house has been remodelled so that the ore, as it is dumped from the skip, passes over a grizzly into a large Blake crusher, which reduces the rock to fragments about two inches in diameter, and passes immediately by gravity with the fine material separated by the grizzly into a smaller Blake crusher which reduces it to less than an inch in diameter. The ore is then conveyed by tram cars to the stamps.

The mill is equipped with 20 stamps with amalgamation plates. It is proposed to treat the tailings by cyanidation.

The power for the plant is generated in two 125-h.p. tubular boilers which run the engines and air compressor. There are two Waterous engines for the crusher and mill respectively. The air compressor is made by the Rand Drill Company and has a capacity of eight drills. There are also two hoisting engines, one of them a double drum Beatty hoist for the vertical shaft, the other a single drum Lidgerwood hoist for the inclined shaft. The plant and the manager's house are lighted by electricity which is generated by a dynamo having a capacity of 125 lamps. The power for the dynamo is furnished by a 6 by 6-inch dynamo engine.

During the summer new foundations were put under the engines and compressor and a cement floor was put in the boiler house. The buildings, aside from the mill and shaft house, consist of an office, a well equipped assay laboratory, a boarding house capable of housing 100 men, several small houses for married men with their families, and a seven-roomed cottage for the manager. On my second visit I was shown

a gold brick valued at about $1,200, which the manager, Mr. Nickerson, stated had been made from the materials obtained in cleaning up the mill preparatory to making alterations.

The work at the Mikado mine has been done upon three veins. On number one vein the inclined shaft has been sunk to a depth of 540 feet, and nine levels have been opened up. On the occasion of my first visit the first three levels were inspected, but as the other levels were filled with water it was impossible to go lower. On the second visit the fourth level had been pumped out and an examination was made of the vein and accompanying rocks. In width the vein does not vary greatly, averaging from four to five feet. The vein material is largely white or pale bluish white quartz, with which are associated thin bands of darker quartz and dark chlorite and other micaceous material which on account of its ready cleavage permits of easy mining.

In addition to No. 1 vein from which most of the gold was obtained there is about 500 feet east a vein lying in the granite belt, which is known as No. 2 vein. A shaft was sunk on this to a depth of 250 feet, and three levels were opened, upon which about 850 feet of drifting was done. Work upon this shaft, however, was discontinued.

About fifteen hundred feet south of the main shaft is No. 3 vein which cuts the altered diabase. An 80-foot shaft has been sunk in this vein, and two diamond drill holes put down which showed that it continued to a depth of five hundred feet. It is stated that the average assay values in the shaft and that part of the vein cut by the diamond drill were about $4.00 per ton.

Tycoon Location

The Tycoon mine on location D 219 has been sunk in granite which for the most part is gray, though in some parts it has a red or flesh color. As a building-stone this granite is an ideal material. The shaft measures 8 feet 6 inches by 5 feet 6 inches, but is filled with water, so that little if anything could be seen of the rock in which it is sunk. A search on the dump showed little if any vein matter, though a little pyrite and some siderite altering to hematite were found. Apparently the mine was sunk with a view to intersecting the Mikado vein, which if produced should come near the island. The equipment has been removed and the mine is abandoned.

Sirdar

Directly north of the Bullion mine on the shore of Bag bay is the shaft of the Sirdar location which is sunk in granite and felsite. The mine is abandoned, and a search of the dump failed to show vein material, although some pyrite and chalcopyrite were seen. It is stated that this shaft was sunk 125 feet and a tunnel driven about 200 feet towards the Mikado claim. The surface conditions are similar to those at the Tycoon mine, and give evidence that the shaft was sunk without competent advice.

Bullion

This property is located east of the Mikado, and the shaft is at the contact of granite and dark altered diabase locally known as slate. The ore here is of interest because it contains molybdenite as well as the other minerals which occur at the Mikado, but most of the specimens on the dump were not highly mineralized.

A test pit in a vein on the Bullion property shows considerable molybdenite and a little free gold, but for some reason no further development was done on this pit and the shaft has been abandoned.

Cornucopia

This property is in Bag bay about a mile west of the Mikado mine on an island known as mining location D 212. The location has been abandoned, and the shaft is filled with water, but the property is of interest inasmuch as the vein contains a considerable quantity of pyrrhotite, apparently, however, unaccompanied by nickel in commercial proportions.

Cameron Island Mine

The Cameron Island mine is situated on an island a little north of the centre of Shoal lake. At the time of our visit the mine was not in operation, but a few weeks previously it had been pumped out with the intention of resuming work. The rock on the island is altered trap, which in some cases contains very little feldspar and might be looked upon as pyroxenite or in some cases as amphibolite. One or two small out-crops of felsite were noticed which are apparently intrusions in the trap. There are in all seven veins on the island, with a general strike of about N. 45° E. On the east side of the island a tunnel has been driven about sixty feet, cutting two of these veins. About the centre of the island a shaft has been sunk 133 feet, and two levels have been opened up, with about 50 feet of drifting on the first level, and 220 feet



Fig. 3.—Contact near Indian Joe mine of hydromica schist and chlorite schist.

on the second. In the second level the main vein averages about four feet in width, the hanging wall is well marked, but the foot wall is not distinct, though there is a well-mineralized contact zone. The vein material is quartz, with schistose bands which consist largely of chlorite. The metallic minerals present are pyrite, pyrrhotite and chalcopyrite. Cross-cuts have been driven on both sides of this vein into the diabase, and in each case a vein has been encountered parallel with the principal vein. On going round the south side of the island it was possible to identify all the veins by the rusty character of the out-crop. It may be said that the principal sulphide in the ore is pyrrhotite, which in its alteration gives a purplish red rusty out-crop. The equipment at this mine consists of one 80-h.p. boiler, one 25-h.p. boiler, one feed water

pump, one mine pump, one 50-h.p. Corliss engine, one 15-h.p. hoisting engine, one Blake crusher, two 5-stamp mills, and two Frue vanners. The mill is in good condition and the machinery well taken care of. The capacity of the mill is about 20 tons per day.

Indian Joe

This property is located on the north shore of Shoal lake near the entrance to Clytie bay. The shaft is sunk in the hydromica schists a short distance from the shore, and at the time of my visit was nearly filled with water, so that the only way of getting any idea of the property was by an examination of the dump. The rock found



Fig. 4—Pseudo-fold, granite in schist, Carl Bay.

consists principally of sericite schists with bands containing siderite and pyrite. Much of the material exposed on the dump had been weathered so that the iron minerals had been changed to limonite, and in many cases, even though no iron minerals were noticed on a fresh fracture, a certain amount of limonite had been formed, so that the rock as a whole resembles in many respects banded iron formation. The ore from this mine consists chiefly of quartz carrying sericite and pyrite, but the vein apparently is narrow, as the chief material to be seen is schist. At this place there are two kinds of schists, one light gray, the other dark greenish-gray to nearly black. The contact between these two is well shown near the old landing, and is an irregular line which crosses the planes of schistosity. (See fig. 3.)

Mining Location M.H. 7

At location M.H. 7, near the mouth of Carl bay, on the south side of Shoal lake, a vein consisting almost entirely of pyrrhotite is found outcropping on the shore of the lake. The vein is about 12 feet wide and is between walls of altered trap. On the surface the pyrrhotite has been oxidized, so that sulphate of iron had been formed in places that were protected from the direct washing of the rain. In other places the oxides of iron had been formed, but the general color of the oxides is purplish red. This seems to be the color most commonly developed in the oxidation of pyrrhotite, so that it may be looked upon as a good indication of the presence of this mineral by a prospector. So far as seen, no work of any account had been done on this claim. The existence of the body of pyrrhotite in the altered trap near its contact with the so-called hydromica schists suggests the possibility that part at least of these rocks may possibly be referred to the iron formation. This supposition is further strengthened by a brief examination of the pyrrhotite deposits on West Hawk lake near Ingolf.



Fig. 5.—Contact of granite and altered trap, Portage Bay.

At the east end of Carl bay a pyrrhotite vein was found about four feet wide near the contact of the granite and altered trap. A small test-pit had been sunk, but work has been discontinued.

A trip was made across Dead Man portage into Portage bay of Lake of the Woods, where on an island near the centre of the bay it was found that at the shore the greater part of the rock is granite which is overlain by altered trap.

On the northeast side of Carl bay, near the contact of the granite and so-called hydromica schists, a peculiar intrusion of granite in schist was found. This is directly at the water's edge and forms a pseudo-fold. (See fig. 4.)

The darker rock shown in the picture is schist with vertical foliation. This has been intruded by granite, which has broken across the foliation and penetrated between the laminæ. Although the schist shows foliation in every part, no trace of foliated texture could be seen in the granite. Going west from this point in Carl bay, it is

found that on the east and south side of McP. 37 granite underlies and penetrates the Keewatin rock in much the same way as on the island in Portage bay.

Sultana Mine

The Sultana mine is located on Sultana island, in Bald Indian bay, about seven miles from Kenora, but the maps show this island as being part of the mainland. The mine is located very near the contact of altered trap and a granite rock, which in the hand specimen and even in its field relations can scarcely be distinguished from some of the granite on Portage bay south of Dead Man portage between Shoal lake and Lake of the Woods. This rock, however, has been mapped as a Laurentian outcrop. The altered diabase at this point can hardly be distinguished from that found at the Mikado mine on Shoal lake.



Fig. 6.—Sultana mine and mill.

The shaft of this mine was completely filled with water, and no mining has been done for several years. There is, however, a short distance to the west of the shaft, an open cut from which considerable ore was taken when the mine was in operation. The vein in this cut is from four to six feet wide, and consists chiefly of quartz. It is of interest to note that this vein makes a turn at an angle of about ninety degrees. The wall rock of this vein is granite, but in the shaft of the Sultana both granite and trap are found, and the vein is said to cross their contact. An examination of the dump shows that the greater part of the rock is trap. Dr. Coleman, who had an opportunity of examining the mine when it was in operation, states that the veins of the Sultana are bedded veins[10] with a nearly vertical dip in chlorite and hornblende schists of Keewatin age. In addition to native gold it is reported that considerable molybdenite was found in this mine, and the tailings along the shore show that there was a large quantity of pyrite and other sulphides in the vein.

A short distance to the east of the Sultana is the old Pashaw shaft, which is sunk in altered diabase on a vein very heavily impregnated with pyrrhotite and resembling in mineral composition and association the material found at Cameron island. The

[10] Coleman, A. P., Gold in Ontario, Bur. Min., Vol. IV. (1894), p. 68.

patent for the Sultana location was issued in 1888 by the Indian Department, but prospecting was not commenced until 1890, and actual mining operations began in March, 1892.[11]

During the time this mine was in operation it is estimated that about one million dollars' worth of gold was extracted, and it was undoubtedly the producer of a larger amount of gold than any other mine in this locality, and possibly in all Ontario.

At the present time, although the shaft is full of water, the mill equipment is in excellent repair, and apparently in condition to resume work on short notice. The affairs of the company are in litigation, and the mine and equipment are under the care of Mr. Richards. This mine is the deepest of any in the Lake of the Woods region, and it is stated that the shaft reaches a depth of 600 feet.

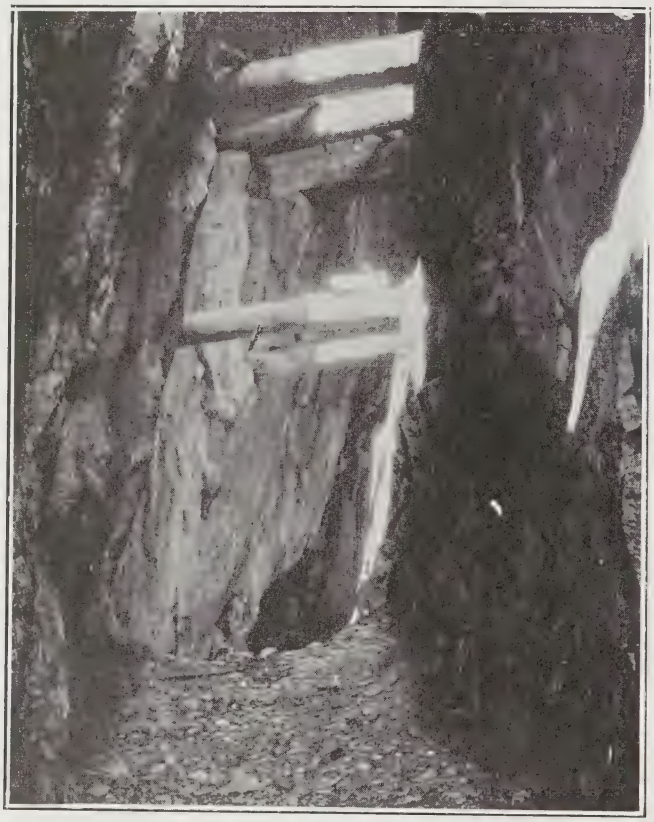


Fig. 7.—Sultana mine, open cut.

There are several veins on and near the Sultana property that have not been worked to any extent.

The mill equipment is as follows: one 100-h.p. Corliss engine, three boilers, 145 h-p., one 10-drill Rand air compressor 12 by 18, one 8-h.p. dynamo engine and one dynamo, one hoisting engine 48 x 60, one gyratory crusher, 30 stamps, 6 Frue vanners, one clean-up pan, one lathe, one drill, 1 shaper. From an economic point of view it would seem that a mill such as has been built at the Sultana mine should be kept running, not only on the product of this mine, but upon the product of adjoining properties, either purchasing the ore at a value based upon the assay and cost of extraction, or treating the

[11] Blue, A., Gold Fields of Ontario, Bur. Min., Vol. III. (1893), pp. 15-19.

ore at a fixed rate per ton. Several mines in the vicinity might easily be worked in this way with greater chances for profit than could be expected if a small stamp mill is erected for every hole sunk in the region.

Ophir Mine

The Ophir mine is located on the west side of Sultana island, facing Quarry island. It is almost at the contact of the altered trap and the Laurentian granite. On the surface the vein is about four feet wide, but, on going down, increases in width, so that at a depth of about twenty-five feet it reaches a width of about six feet. The vein matter is principally quartz of a bluish white color, which is frequently sprinkled with particles of gold visible to the naked eye. On our first visit to the Ophir mine the shaft was full of water, but on visiting it again in the latter part of August we found that Mr. Richards, who also has charge of the Sultana mine, had during the summer pumped out the mine and was preparing to begin mining operations. It is to be hoped that this mine may have a fair working trial, as the quartz that is taken



Fig. 8.—Burley's shaft.

from the mine is apparently a rich ore, and all who have mentioned this mine in their reports seem to agree that it is an exceptionally promising prospect. At the present time, although it is called a mine, it can be considered only as a prospect upon which the assessment work has been well done by clearing a large part of the vein, and sinking the shaft so as to show the continuance of the ore body to a depth of about a hundred feet.

Burley's Shaft

Directly opposite the open cut of the Sultana mine is a peculiar structure known as Burley's crib, which was erected on an island about a half-mile from its present site about 1897, and towed by steamer to this point. It was sunk by loading with rock so as to rest on clay which had been put on the bottom of the bay. A shaft was put down to intersect the extension of the Sultana vein under the lake. It is reported[12] that diamond drilling had shown an extension of the Sultana vein which was thick

[12] Bur. Min., Vol. VII. (1898), p. 115.

enough and rich enough to warrant this expenditure. Further progress in the development of this mine and plans of the crib and shaft have been given in detail by Mr. Bow.[13] The mine was idle from June, 1899, to the summer of 1903, when it is reported[14] that the shaft was pumped out preparatory to carrying on further development, but no report of such development was ever made, and the mine is now idle.

Locations on Big Stone Bay

Formerly on Big Stone bay several mines were sunk, among which may be mentioned the Keewatin, the George Heenan, the Winnipeg Consolidated, Black Jack, Gold Hill, and Golden Gate. On Blindfold lake, which may be considered as a part of this same district, was located the Black Jack mine.

Of these mines the first three and the last were visited by the writer, but all the buildings are practically in ruins, all equipment has been removed, the shafts are filled with water, and little trace of the veins could be found. The vein of the Winnipeg Consolidated mine was seen in the shaft, and at a depth of six feet it has a thickness of about three feet and is between walls of altered diabase.



Fig. 9.—Regina mine.

At the Black Jack mine, on Blindfold lake, the vein, which shows in the shaft, is from five to six feet wide. The vein material on the dump consists almost entirely of quartz, and is similar in appearance to the quartz at the Ophir mine, but not so blue. The country rock is granite and gneiss of Laurentian age.

At the George Heenan location the camp was in ruins, and although a small test pit was found, the shaft could not be located.

At the Keewatin mine most of the buildings have been burned; the shaft house, however, still remains, but has been stripped of its machinery. The rock on the dump consists of altered diabase and hornblende schist, with some pyrite. Around the ruins of an old building was piled considerable quartz which contains a good percentage of pyrite, and if this represents the vein material it gives fair promise.

[13] Bow, J. A., Bur. Min., Vol. VIII. (1899), pp. 52-54 and 64.
[14] Carter, W. E. H., Bur. Min., Vol. XII. (1903), p. 60.

Regina Mine

The Regina mine, which is also known as the Black Eagle, is located on the south shore of Regina or Lobstick bay of Lake of the Woods. Upon this property are eight distinct veins varying in width from a few inches to 12 or 15 feet. The main shaft is sunk on No. 3 vein, and although the mine is not working at present, the water has been kept below the fourth level. The buildings and equipment of the mill are in excellent condition, and work could be resumed with very little delay. The vein upon which the shaft is sunk varies in width from about 2 feet to 6 feet with a general average, so far as seen by the writer, of about 4 feet, and at only one place was a width of less than two feet noted. The vein cuts the contact of granite and a more or less altered trap, and in this respect is like the Mikado and Sultana mines, which, with the Regina, have furnished most of the gold obtained in this region. The shaft has been sunk to a depth of 545 feet, and nine levels have been opened up at intervals



Fig. 10.—Regina mill.

of 60 feet. Although the vein as seen in the upper four levels averages about four feet in width, it is said that it increases in the lower levels to a width of eight to twelve feet. The shaft follows the dip of the vein, so that there are some objectionable curves in it, and hitherto all the hoisting has been done by bucket. The vein is principally quartz, though in places a fair percentage of a rusty carbonate is found intermingled with the quartz. Apparently there is a good quantity of ore in sight for conservative mining, and a study of the plan of the workings seen at the mine would indicate that the pay chute has not been entirely worked out. This mine is credited with a production of about five hundred thousand dollars, but apparently it was worked at a loss.

The West vein, which is about 20 feet wide, consists of two parts, that upon the north being quartz interbanded with rusty carbonate, while the southern portion consists almost entirely of this rusty carbonate.[15] A shaft has been sunk about 70 feet. This vein is in the trap, and its extension into the granite has not been found. No. 1

[15] A carbonate vein of similar dimensions at Porcupine, in northeastern Ontario, may be compared to this deposit. It is known as the West Dome, or Foster.

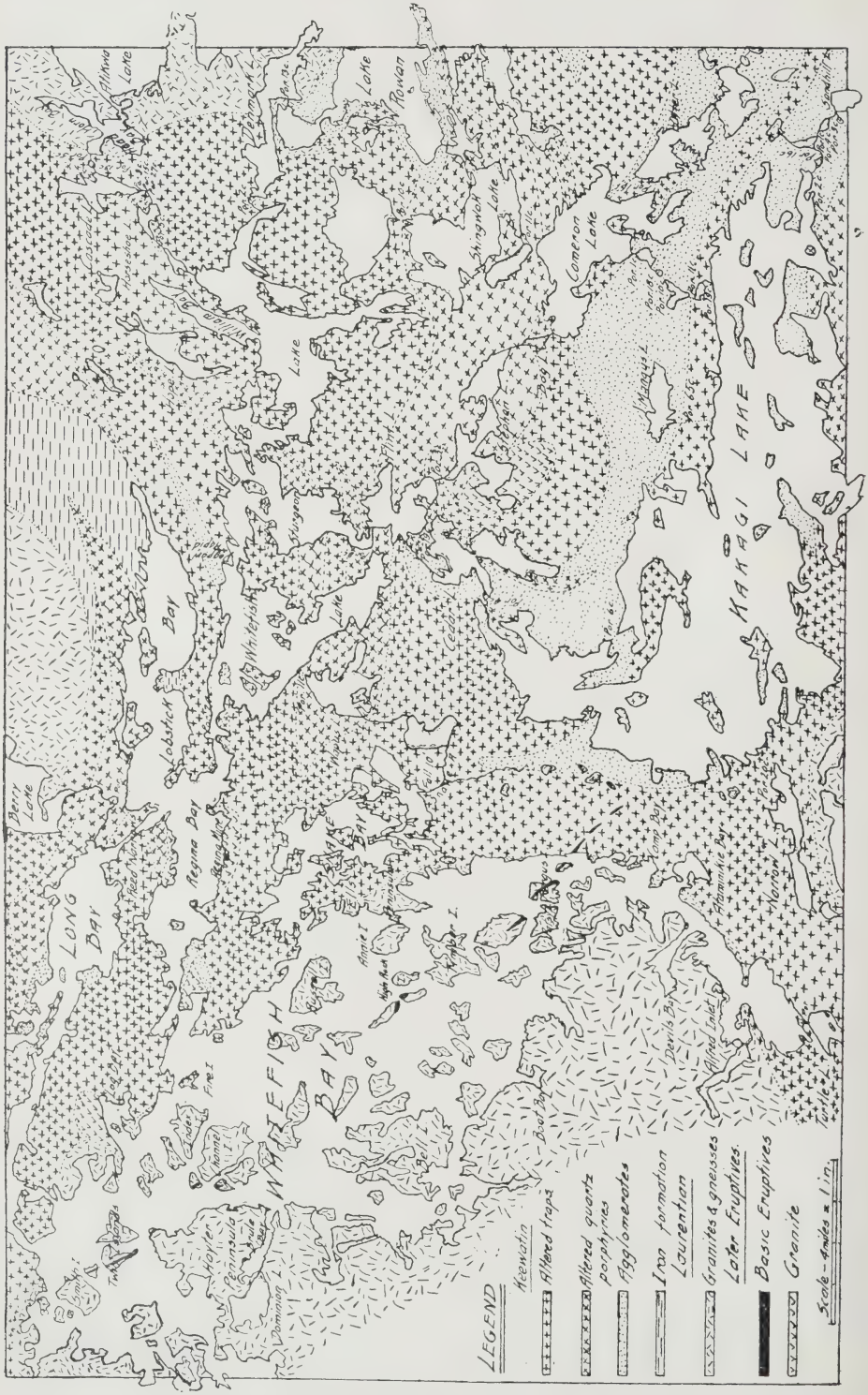


Plate No. 2.—Whitefish and Regina bays,

vein consists of quartz, and is in the granite a short distance east of the west vein, near the dwelling houses, and is from 6 to 8 inches wide. No. 2 vein varies in width from a trace to a foot, and is near No. 1 vein and has the same sort of wall rock, but no opening has been made either upon No. 1 or 2 veins. No. 4 vein is to be seen just back of the manager's house. It is about a foot wide and has been exposed for about 150 feet. No. 5 vein is small, and so far as seen does not exceed 3 or 4 inches in width, and no opening has been made upon it. Nos. 6 and 7 veins come together, giving a total width of about 3 feet at their junction. Both veins are quartz of granular texture in a country rock of altered diabase. A tunnel has been driven on No. 6 vein and shows it to be about 7 inches wide at the lake level.

The mill equipment is as follows: 30 stamps (gravity), 10 Tremaine steam stamps (formerly 14), 4 Wilfley tables, 1 Gates gyratory crusher, 1 belt conveyor from crushing house to mill, 1 clean-up pan, two 80-h.p. and one 50-h.p. boilers, 1 hoist (12 x 12 inch cylinders), 1 crusher engine, 1 Corliss engine, 1 compound air compressor, 3 mine pumps, 1 feed-water pump, 6 air drills, 1 lathe, 1 drill, 1 planer, 1 upright engine, 1 dynamo, 1 engine for the dynamo.

Alterations in Geological Mapping

Minor changes were made in the geological mapping on Whitefish and Regina bays. On coming south through the Passage from Long bay to Whitefish bay, we continued west and found that the large island north of Smith island, together with the main land between this point and the Passage, consists of altered trap of Keewatin age. On going to the small bay behind this island Laurentian rock was found outcropping. In the small bay just south of the narrows (Sioux narrows) between Whitefish bay and Regina bay a granite outcrop has been mapped, but its extent is not so great as heretofore indicated. The probable extent is shown on the map accompanying (See plate No. 2). Another change, too small to indicate on a map of such a scale, should be made on the north shore of Regina bay, where a small intrusion of granite should be mapped as coming between the altered traps and altered quartz porphyries or hydromica schists.

Scramble Mine

A visit to the Scramble mine northeast of Kenora proved of interest from a geological point of view. The mine is sunk in a vein which consists largely of chloritic material interbanded with quartz, with a considerable amount of pyrite. The samples of vein material seen upon the dump have a marked resemblance to some of the leaner phases of the iron formation, but, although it is the opinion of the writer that several of the so-called veins may have the same origin as some of the bands of this formation, at the present time such correlation cannot be made. So far as was observed, no carbonate bands exist in the vein, but as the only material upon which judgment could be based is the waste rock and vein material on the dump, it cannot be positively stated that these are not present. The absence of these materials would serve to differentiate this vein from other veins in the region. The country rock is altered diabase, which exhibits a pillow structure in places. A mill-run was made several years ago on ore from this mine at the School of Practical Science, but the writer has been unable to get the result. The mine was idle at the time of my visit.

Allie Island Copper Deposits

On June 5th, having received supplementary instructions to examine the reported discovery of copper on Allie island, Lake of the Woods, I visited the claims on this island which have been taken up by F. W. Moore. These copper locations are on the south side of the island and are in a decomposed rock which consists principally of chlorite or serpentine. On exposure to the air this rock slacks like lime or marl, and resembles the serpentine from Hoboken, New Jersey, and the decomposed serpentine from Lancaster county, Pennsylvania. On first examining this rock no trace of copper was to be seen, but on crushing and panning the crushed material, small pellets, and crystals

of copper were obtained. The crystals which are found are invariably octahedral in form, and vary in size from mere grains up to one-fourth of an inch in diameter. The chloritic rock in which the copper occurs is apparently the result of the decomposition of a diabase with which it is in contact, and some specimens when broken open exhibit a nucleus of comparatively fresh diabase with an outer zone of the chloritic rock. A search was made for sulphides in the diabase but without success, although a few small specks too minute to be indentified in the field were found, which resemble pyrrhotite.

Four claims had been staked out, and two shafts about twenty feet deep had been sunk. The amount of copper found in the rock up to that time was apparently not sufficient to be of economic value. A second visit was made on September 1st. During the summer a new shaft about forty feet deep had been sunk near the more promising of the earlier shafts, and at this depth the rock was still soft and chloritic. On going down into the shaft a considerable improvement was noted in the character of the ore. The mine is just west of French Narrows, about 14 miles from Kenora. In case this property proves of economic value there should be a further development in copper mining on Lake of the Woods, as the same type of rock having similar geological relations is found on the west side of the large island between Queer and Middle islands.

Carbonaceous Schists

A visit was made to the west side of Corkscrew island in Ptarmigan bay for the purpose of examining some small deposits of carbonaceous schists. These schists are found in narrow bands near the contact of the hydromica schists and the altered diabase. They consist principally of thin films of graphitic material between layers of the hydromica schist. The best development of this graphitic material is in a contorted band or vein between parallel beds of schist, which shows considerable variation in texture and ranges in color from grayish green to nearly black. From an economic point of view, this material is valueless, but it is mentioned here because several deposits of this sort are found in the Lake of the Woods region, and samples have been shown to the writer which come from regions round Port Arthur and Duluth, Minn. In nearly every case investigations have been made to show the value of such material as coal deposits, but so far as they have been investigated they have proven absolutely without value.

Molybdenite

The existence of the molybdenite in the Lake of the Woods region has been noted by Lawson,[16] who mentions an occurrence of this mineral in veinules traversing granitoid gneiss on Quarry island near the Sultana mine. A visit to Quarry island was made, but unfortunately the veins carrying molybdenite could not be found. It is also reported that molybdenite was found in the ore at the Sultana mine.

On examining the Mikado mine, the writer found small particles of molybdenite disseminated in many parts of the vein.

On mining location D 149 in Bag bay of Shoal lake, about a half mile from the Mikado mine, is a vein in gray granite, below the lake during high water. The vein is about a foot wide and consists principally of quartz in which scales of molybdenite nearly half an inch in diameter are scattered rather abundantly. Much of the molybdenite is oxidized so as to form the yellow oxide of molybdenum, molybdite. The vein at this place is mostly under water and in all probability not more than 20 feet could be exposed above water.

Building Stone

On Lake of the Woods and Shoal lake are several localities where good building stone may be obtained for local use. The rock most favorable for this purpose is granite, and suitable material may be obtained on Quarry island about seven miles southeast of Kenora. This rock has been quarried some time in the past, and it is stated that when

[16] Geol. Sur. Can., 1885, CC. 144.



Fig. 11.—Diabase cliff, Crow lake.



Fig. 12.—Crow (Kakagi) lake.

the Canadian Pacific railway was being built the stone for several bridge abutments was obtained here. The granite is moderately coarse grained but would dress nicely, and makes an excellent material for building and monumental purposes.

East of the Mikado mine on Shoal lake is a large granite area, which also outcrops on Echo bay of Lake of the Woods. On the Shoal lake side the granite is usually gray in color, though occasionally flesh colored granite is seen, and this is also an excellent building material.

At Hawk lake station a quarry has been opened up in Laurentian granite. The stone is an attractive one for building purposes, and has been used in the construction of the new court house at Kenora. Much of the rock is shipped to Winnipeg, and finds favor with the builders of that city.

Many other good granite exposures are to be seen on Lake of the Woods, but those mentioned are probably the most desirable for building purposes. The distance from railway transportation is a bar to the development of these deposits for anything but local use.

The large deposits of trap rock in this vicinity furnish a material which is hard and tough, but not desirable as a building stone because of its liability to disintegration. This material, however, makes ideal road metal, and should be used to a greater extent in making roads in this region.

Lake Manitou Area

The rock in the area covered by our map (Plate No. 3), is principally diabase, altered diabase and porphyrite. West of Mud lake nearly all the rock is schistose and has a general strike of N. 30° E. to N. 45° E. About the centre of this portion is a band of altered quartz porphyry (so-called), varying in texture from an almost unaltered rock, having approximately the composition of andesite, and which on being crushed is converted first into agglomerate breccia, and finally into sericite schist. Between this formation and Mud lake the rock varies considerably in texture, in some cases being nearly unaltered diabase, grading on the one hand into porphyritic diabase and on the other hand into a rock showing large lens-like markings—pillow structure. All these rocks have undergone alteration to a greater or less extent and have been converted into schists. Near Mud lake is a band of sericite schist, which passes through the properties of the Paymaster and Detola mining companies, crosses the lake and skirts the east shore of the north end of the lake. East of Mud lake the rock is almost entirely diabase, which in the southeast corner of the map is hardly altered, but nearer Mud lake shows considerable schistosity. Upon the map some of the principal veins are indicated, but an inspection shows that a large number of them consist of a light colored schist, containing quartz and a considerable percentage of pyrite. In general, these veins have the same strike as the schists in the region, and it is the writer's opinion that they have been formed by movement of the igneous rocks, which resulted in slaty cleavage being developed, and that the gold values and quartz have been deposited by secondary enrichment. As a rule these veins contain a fair percentage of chlorite and possibly talc, and it would appear that they are largely the result of the alteration of basic igneous rocks. In a few cases veins are to be seen which are largely composed of pure quartz, which shows little if any banding. Such veins are found on claims G. 27, H.P. 301, and on H.P. 371, near the office of the Laurentian mine. On the road leading from the Little Master mine to the government road is a pyrite vein on claim S. 29, which apparently lies in about the same band as the Jubilee and Laurentian veins. Most of the other veins in this neighborhood are of the schistose type, and so far as the writer could judge this is the character of the Laurentian, Paymaster and Detola veins.

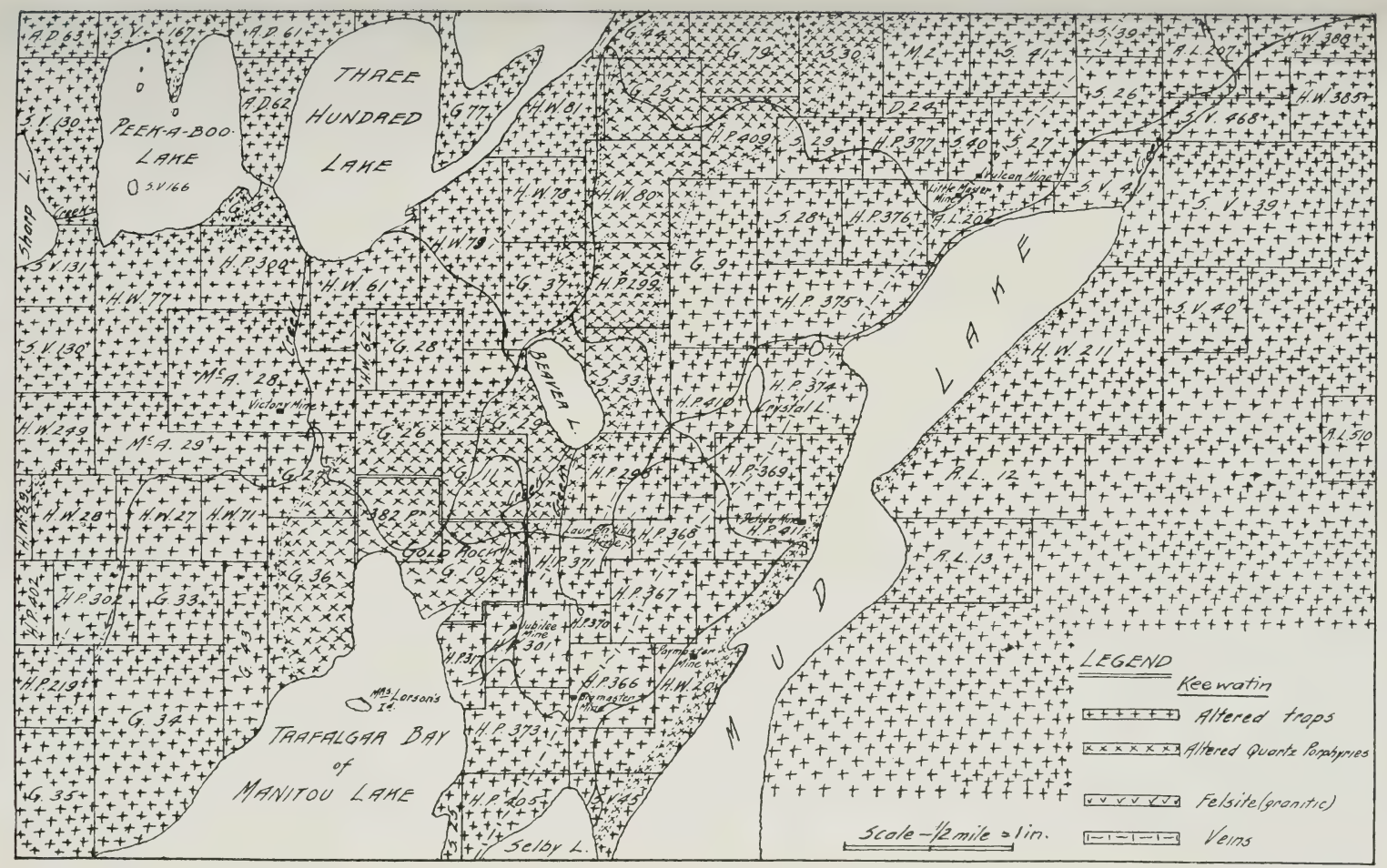


Plate No. 3.—Gold Mining area of Gold Rock and vicinity.

The map of the Manitou region, issued by the Geological Survey of Canada, indicates the formation in the neighborhood of Gold Rock as agglomerate. Near the landing the rock has a mottled appearance (see fig. 16), and might with propriety be classed as such. An examination of these rocks, however, shows that they grade on going westward on G. 36 into a so-called quartz porphyry, and the microscope indicates these mottled rocks to be breccias developing a schistose structure, and derived from the type of the rock found just to the west.

If all fragmental rocks in this region are to be classed as agglomerate, the determination of Mr. McInnes is correct, but as this is evidently derived by brecciation from an igneous rock, it is probably better to remove it from the somewhat doubtful classification. The extent of this formation along the shore of the lake is not so great as was supposed by Mr. McInnes, as its contact with the altered trap on Manitou lake comes within the limits of our map.



Fig. 13.—Gold Rock, Upper Manitou lake.

East of this body of altered quartz porphyry the rocks have previously been mapped as altered quartz porphyries, and it is probable that this determination was made as the result of the examination of outcrops on some prominent points along the shores of Mud lake. As will be seen from the map (see Plate No. 3), there is a band of altered quartz porphyry or sericite schist, which extends from Selby lake through the Paymaster and Detola properties, and after crossing Mud lake skirts the east shore of the north end of the lake. The actual width of this rock is somewhat exaggerated on the map, particularly on the east side of the lake, where it is found as a narrow band at three points along the shore. Between this body of sericite schist and the larger body of similar rock at Gold Rock altered diabase and porphyrites are the only rocks found by the writer.

To the east of Mud lake the rock within the limits of the map is nearly all basic igneous rock, which is more or less altered. For the most part the rock is dark, but there are a few bands of light colored porphyritic diabase, which in some cases have developed schistosity and have a slight resemblance to the altered quartz porphyries. In going east from Mud lake to Mountain lake the rock is entirely diabase, which shows less alteration than most of the similar rock in the region.

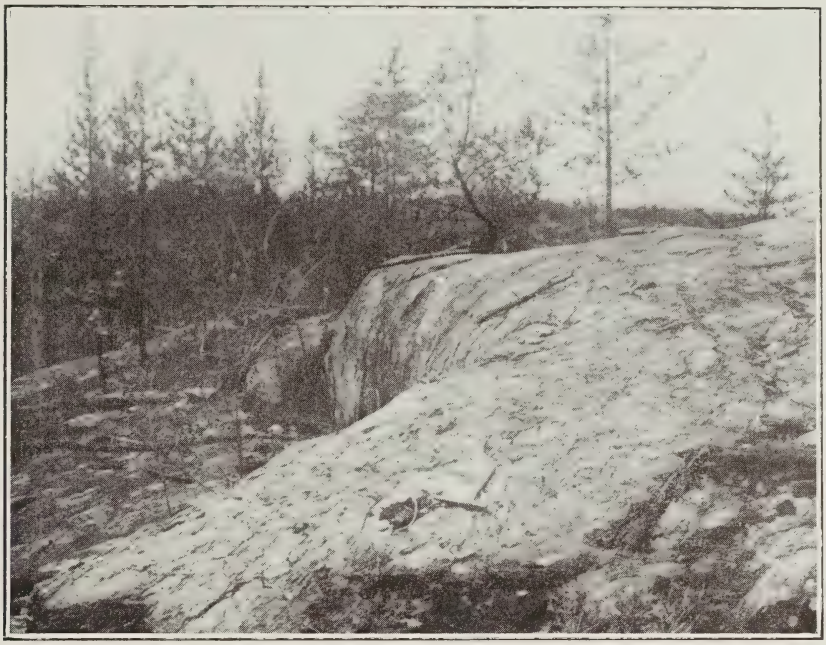


Fig. 14.—Diabase showing pillow structure.

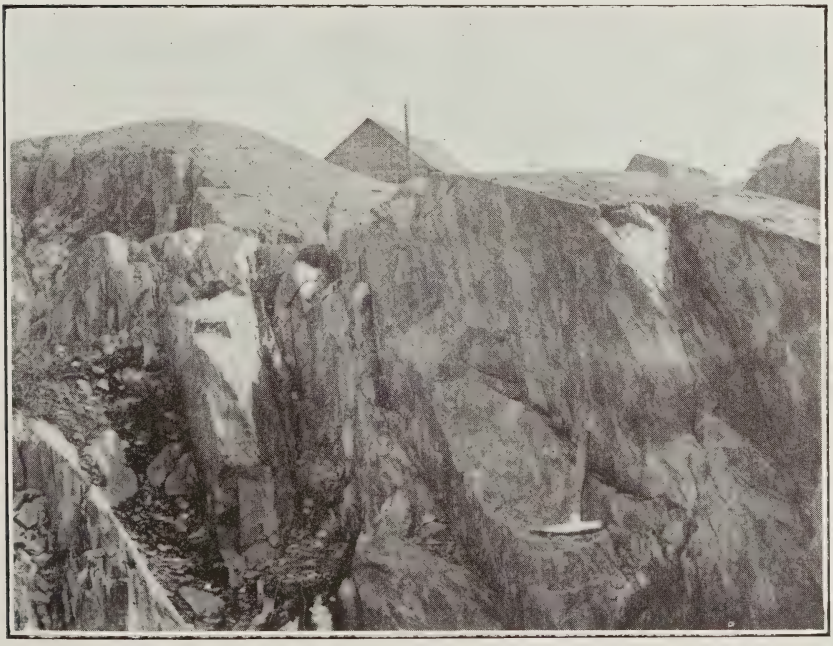


Fig. 15.—Altered quartz porphyry, Gold Rock landing.

A few outcrops of granite or felsite were found near the outlet of Peekaboo lake and on H.W. 28, and an examination outside of the limits of the map showed that isolated outcrops are found along the extension of the line joining these areas, and may possibly be assumed to be outlying exposures of a granite area, some two or three miles southwest of this point.

A marked variation in the compass was found in two places near Gold Rock. On the bluff overlooking Manitou lake at the north end of H.P. 317 the compass needle was deflected about 45° and the dip needle was deflected 66°. This probably indicates the presence of a body of magnetite in the trap, but it is not a large body, as the variation was found only in an area not more than one hundred feet in diameter. A similar magnetic variation was noticed on the diabase east of Mud lake, but this is likewise a limited area.

Victory Mine

The Victory mine is located on claim McA. 28 about midway between the village of Gold Rock and Peekaboo lake. The country rock here is diabase, with possibly some diabase agglomerate. At the mouth of the shaft is a light gray schist, and from the appearance of the material on the dump it would seem that this schist contains a notable percentage of carbonate of iron, which on exposure to the atmosphere is converted into limonite. Interbanded with this schist are bands of quartz which give an appearance to the vein material similar to specimens found in the iron formation. This schistose structure is quite characteristic of the veins found in this region, inasmuch as a large number of the mines have been sunk in such material. Frequently these veins show large bands of quartz, which have probably been formed by crystallization from a solution coming through the crevices in the rock, though it is by no means certain that the whole vein may not be the result of alteration of the wall rock with the removal of a large percentage of the iron and other bases by solution, and a separation of silica as quartz. The shaft of the Victory, which is 100 feet deep, is filled with water, consequently no examination of the underground working could be made. Through the window of the boiler-house could be seen two boilers, a hoisting engine, and an air compressor, so that the mine is equipped for work, but not for milling. A short distance from the mine are the office and several dwelling-houses, which are in good condition.

Laurentian Mine

On location H.P. 371 is located the Laurentian mine, which has produced most of the gold taken out from the Manitou district. Four veins were seen by the writer on this property, but the one upon which the shaft has been sunk is probably the largest. The ore body consists of bands of quartz varying from a mere trace up to several inches in width. On the second level of the mine a cross-cut has been driven towards the west, and it is there seen that at the margin of the vein is a brecciated wall rock which grades into a porphyritic diabase. At a distance of less than 40 feet from the vein this porphyritic diabase merges into a darker diabase of uniform texture, and beyond that point the rock is almost entirely dark diabase. Occasionally schistose bands are found which, when quartz is present in thin stringers, may be regarded as ore bodies. The width of this principal vein in some portions is as much as 40 feet, but probably will not average more than 20 feet, the extreme width of 40 feet being exposed in one of the stopes.

The shaft which is 7 x 11 feet outside of the timbers is inclined and follows the dip of the vein. Four levels have been opened up at intervals of 100 feet, and the ore is hoisted in a skip to the shaft house, where it is dumped into a second skip and conveyed by an inclined tramway to the mill. The waste rock is removed by small cars to the dump.

Just east of the mill is another large vein which has not yet been opened up. West of the mine at the side of the road going to the office a quartz vein about a foot and a half wide is exposed, and it is stated that this vein is an extension of the Jubilee

vein on H.P. 301, but it is difficult to correlate these two inasmuch as there is some swampy land lying between. A little farther west in a field south of the road leading to Gold Rock a fourth vein is found, but it is exposed for only a very short distance.

The equipment of the engine room and mill consists of four boilers, one of 90-h.p., the other three 50-h.p. each, a double drum hoisting engine, one-half of an Ingersoll Sargeant duplex air compressor which is capable of running six drills, and three mine pumps. The mill is equipped with a Blake crusher having an opening of eight by twenty-four inches, 20 stamps with four amalgamating tables, and a Wilfley table by means of which the pyrite in the ore is separated.

At the time of our visit the mine was closed down, but four men were employed to care for the property and keep it pumped out. There has been a change in the management of this property and it was expected that the mine would be re-opened very soon. A supply of wood for fuel was being laid in.

The buildings on the Laurentian property are in excellent condition. In addition to the shaft house and mill they include a well equipped assay laboratory, blacksmith shop, stable, and comfortable dwelling houses which are lighted by electricity generated at the mine. The magazine is located several hundred feet south of the mine in a tunnel driven into the diabase.

Jubilee Mine

The Jubilee mine on H.P. 301, has been sunk on a vein of quartz which varies in width on its surface from about 18 inches to four feet. Along with the quartz is a schist highly impregnated with siderite or ferro-calcite which increases the width of the vein so that at its narrowest point it is about three feet wide. This siderite schist is similar to the carbonate schist in the west vein of the Regina mine on Lake of the Woods, and to the carbonate schists found in the other mines in the vicinity of Gold Rock. The shaft has some water in it, but is exposed to a depth of about 40 feet and its total depth is said to be about sixty feet. It is stated that good ore was found in this shaft, and it was looked upon as one of the promising prospects in the vicinity. There are no buildings about the shaft, and the property can be considered only as a prospect upon which the development work has been well done.

The Big Master Mine

This mine is located upon location H.P. 366, and is almost directly south of the Laurentian mine. The vein upon which this mine is sunk is similar in many respects to the Laurentian vein, but has been traced for a greater distance and apparently is the same as is found at the Little Master and Volcanic Reef mines. This mine is filled with water, but the mining and milling equipment are in good shape and under the care of Mr. A. Kay. The buildings at the mine consist of a shaft house and a machine shop, and a storage house for supplying an aerial tramway which conveys the ore to the mill about a quarter of a mile distant on the shore of Manitou lake. In addition to the mine buildings, there is a large boarding house and several small cottages for the men connected with the mine.

The equipment at the mine consists of two Jenckes boilers, one hoisting engine, with a three foot drum, one Rand compressor, one engine for the machine shop, one lathe, and three pumps.

The shaft is vertical and has been sunk 300 feet. Three levels have been opened up. The vein which on the surface is about five feet wide is said to increase to eight feet in width on the third level.

The equipment of the mill consists of one Jenckes boiler, one Jenckes engine, 10 stamps, one Blake crusher and four vanners.

The mine has been shut down for a number of years, and considering the length of time that it has been idle the equipment is in good condition.

A weathered sample of the vein material taken from the dump shows a remarkable similarity to the iron formation. It consists essentially of bands of chlorite between which are included lenticular portions consisting largely of carbonate of iron and

quartz, indicating that in all probability this vein is formed directly from the alteration of the surrounding rocks. Adjoining the vein the country rock is diabase and porphyrite which in some places develops a well marked schistosity.

The formation of veins of this character in basic igneous rock occurring in Eastern Ontario is thus described by Prof. W. G. Miller. He states that:

Cracks have been formed in the diorite or gabbro through the shrinkage of the mass itself or by the contraction of the later intruded granite masses which occur in other parts of the district. These cracks have formed channels, at some long distant period before the surface was worn down to its present level by agents of denudation, for the passage of what were in all probability more or less highly heated and impure waters. The waters have acted on the walls of the cracks and have dissolved them away to a considerable extent in many places, thus making cavities which were afterwards filled by the deposition of minerals from solution. Much of the rock matter acted on by these waters still remains in place along the water channels and is now represented by chloritic or biotitic schist. This schist forms a considerable part of the ore, as it contains gold-bearing stringers of quartz and highly auriferous pyrite through it.

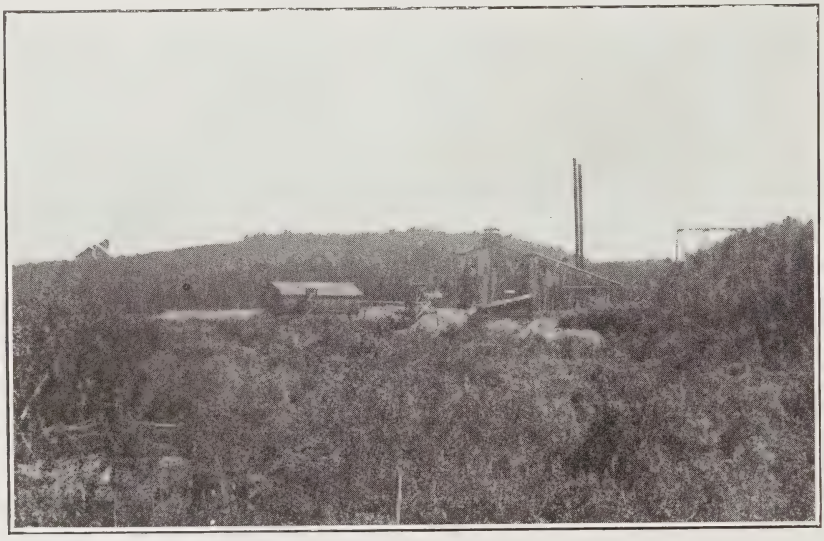


Fig. 16.—Big Master mine, Gold Rock.

A good example of the effects of water in changing an igneous rock of this character into a schist along the walls of cracks followed by the water is seen on the face of a cliff at the Deloro mine in Marmora, where a crack in the rock near the upper part of the cliff runs vertically for a few feet, then turns and runs horizontally, then takes a vertical direction again. The crack followed by the water is very narrow, but is bounded by two or three inches of chlorite schist, the lamination of the schist being parallel to the direction followed by the crack in different parts of its course.[17]

In mentioning the vein at the Victory mine, which is similar to the Big Master vein, Mr. E. T. Corkill states that it "consists of lenses of quartz occurring in a slaty formation or vein filling in the greenstone. This slaty formation is an altered variety of the greenstone."[18]

It would seem from the evidence at hand that the gold-bearing veins in this district have been developed by a conversion of the rock in the fracture zone to chlorite, talc or in some cases to mica, and the formation of carbonates and possibly quartz from the alteration of the rock. Such an explanation would account for the formation, not only of the Big Master vein, but the others in this region.

[17] Miller, W. G., Bur. Min., Vol. XI. (1902), p. 189.
[18] Corkill, E. T., Bur. Min., Vol. XVII. (1908), p. 64.



Fig. 17.—Paymaster mine.



Fig. 18.—Paymaster mill.

Paymaster Mine

On the west shore of Mud lake on location H.W. 20, is located the Paymaster mine, belonging to the Northern Development Company. At this place a vertical shaft has been sunk to a depth of 325 feet on a vein in altered traps, and three levels have been driven at 100, 200, and 300 feet respectively. From the drift of the first level a cross-cut about 25 feet long has been driven toward the west, on the second level a drift has been extended 80 feet to the southwest and 180 feet to the northeast, and an upraise from the north end of about 90 feet. A cross-cut about 25 feet long has been driven to the west near the shaft, and two other cross-cuts, one 40 feet long, the other 70 feet, have been driven eastward from this level. On the third level the drift has been extended 150 feet to the northeast with an upraise of about 80 feet at the end and a cross-cut about 40 feet long has been driven to the west and another 135 feet toward the east. Going east in this last cross-cut it was found that the ore-body which is a band of schist similar to other veins in this vicinity, with the exception that it shows little, if any, oxidation of iron, has for its walls a dark diabase which is succeeded by a light colored diabase grading into a porphyritic diabase. At intervals schist was found in veins parallel with the one upon which the shaft is sunk. In one of these veins about 25 feet east of the shaft a band of dark quartz a couple of feet wide was seen. Examination of the rocks on the surface led the writer to believe that the schistosity is due to slaty cleavage and has no relation to the strike of the rock, as it crosses the contact of different rocks in almost any direction. It also appeared that there is no reason why the veins should not continue to great depth, although it is known that in some cases, as for an example, at the Sultana mine the veins have pinched out, though at this latter place a new vein was found near the first one and below it. The mine is well equipped both for mining and milling operations. The shaft is provided with a cage 4½ x 4½ feet. The engine room is equipped with a compressor, a double cylinder 8 x 10-inch Lidgerwood hoisting engine, a 250-light dynamo, and a 40-h.p. engine. The mill is equipped with a Blake crusher, 10 stamps and two vanners, and a 65-h.p. engine. There are four pumps about the mine, one of which is located in a pumping station on the shore of the lake and furnishes the water for the mill and boilers. In the boiler house are two 65-h.p. tubular boilers. A comfortable boarding house, office and several cottages provide for the comfort of the management and employees.

The Detola Mine

On location H.P. 411 on the west shore of Mud lake is located the Detola mine. At the time of my visit about 25 men were at work under the direction of Mr. Dryden Smith, manager of the mine. An excavation had been made for erecting a stamp mill, on the shore of the lake, in so-called hydromica schist. The schist is apparently of the same nature as the veins in this vicinity and the nature of the slaty cleavage is well shown in figure 20. The schist, as will be observed, has vertical cleavage and splits easily. At the extreme right of the picture can be seen the smooth face of the schist parallel to the planes of schistosity, while in the centre the cross section of the schist is shown. On July 11th the foundation of the mill was started, and on July 27th the structure had reached the stage shown in the illustration.

At the mine proper the buildings consist of a boiler and engine house, blacksmith shop, shaft house, dry house, and store house. There is also a comfortable house for the manager which is combined with the boarding house, and at a short distance is a lodging house for the miners. Everything about the property is well kept, and every provision seems to have been made for safety and reasonable comfort. The shaft has been sunk vertically to a depth of 235 feet, and two levels have been opened up. The hoisting is done in a bucket, but provision is made for installing a cage at the proper time. A tramway is being built from the mine to the mill so that the ore can be taken directly to the mill for treatment.

A cross-cut has been driven about 100 feet each side of the main vein on the second level, and about seventy feet west of the shaft is a vein consisting principally of schist

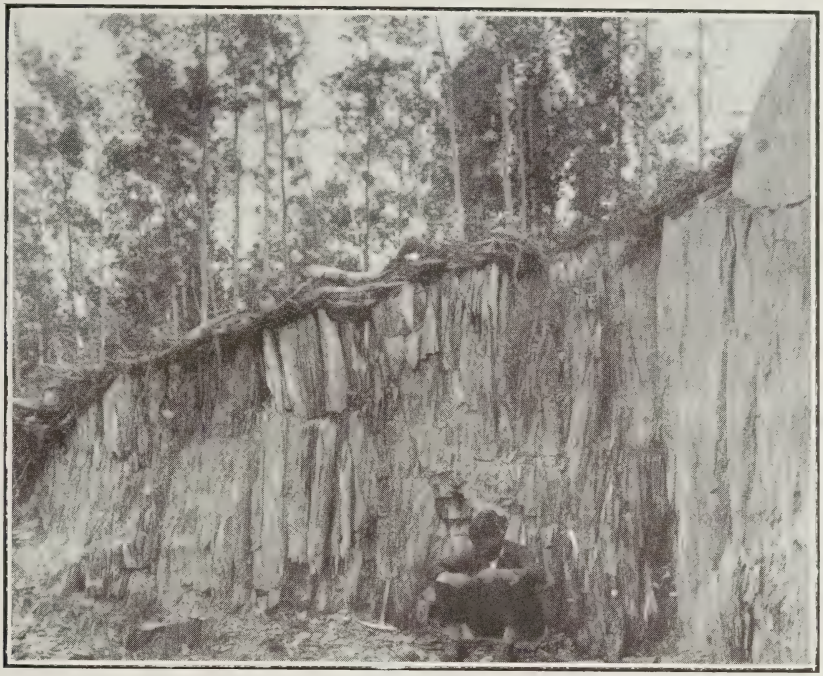


Fig. 19.—Altered quartz-porphyry (so called), Detola mine.



Fig. 20.—Mill at Detola mine in course of construction.

and calcite. In the east cross-cut about 85 feet from the shaft a banded quartz vein was found; between these veins the rock is diabase, which is to a large extent porphyritic. Nearly west of the mine another vein has been found, which is called the Jack-pine vein. This is in altered trap and is about one foot wide on the surface. Still another vein is located near the northwest corner of the property and consists of a body of pyrite about three feet wide.

The main vein upon which the shaft is located is schistose and carries both quartz and calcite, and appears to be of the ordinary type developed in this region.

Little Master Mine

The Little Master mine is located on claim H.P. 375, near the north end of Mud lake. The veins of this property have been described in earlier reports, and as the boiler house was burned down several years ago and never rebuilt, nothing further can here be added. The boarding house and other dwelling houses are in good condition and are under the care of Mr. John R. MacDonald. The principal vein is apparently a continuation of the Big Master vein, or of a parallel vein at no great distance from it.

Volcanic Reef Mine

This property is on S. 40, which is located just north of the Little Master mine, and the vein upon which the mine is sunk is a continuation of the Little Master vein. The mine is closed down, and the shaft partially filled with water. Information was not secured in regard to the workings, and nothing can be added to the description in the report of this Bureau for 1905.[19]

Foulis Property

The condition of affairs at the Foulis property had not materially changed since Mr. Corkill's report on same.[20] Some work was done during the summer, and late in the season arrangements were made for opening up the mine on a larger scale.

Glass Reef Mine

A visit was made to the Glass Reef mine on July 1st. The new feature at this point is the removal of the mill, which has been sold to the Detola mine, and in consequence the Glass Reef may be looked upon as a mine whose history is finished.

Minnehaha Mine

While waiting for the steamer which was to take our party to Dryden a brief visit was made to Minnehaha mine on the north side of Minnehaha lake. At the time of the visit no work was in progress, but some work had been done earlier in the season. There are two shafts which have been sunk 100 feet on a quartz vein in diabase. Along with the quartz is about 5 feet of schistose vein material similar to that already described in connection with the mines round Gold Rock. A tunnel about 40 feet long has been driven into the diabase to intersect this vein, but as yet there remains considerable distance between the end of the tunnel and the vein. Comfortable buildings have been erected for the camp and offices.

Molybdenite

Near the south end of Smooth Rock lake in the Manitou region an occurrence of molybdenite which is of scientific interest was found by the writer. The rock at this point is mapped by Lawson as altered trap, with which determination the writer agrees. This rock outcrops on the lake between Laurentian gneiss and later granite. In this trap is a vein on location 148 S.V., which carries pyrite, pyrrhotite, gold and molybdenite. A sample taken at random from this vein assayed about $2.50 per ton in gold, and it is reported that the average of former assays is about $10.00 per ton. A shaft about forty

[19] Bur. Min., Vol. XIV. 1905), Part I., p. 52.
[20] Bur. Min., Vol. XIX. (1910), Part I., p. 79.

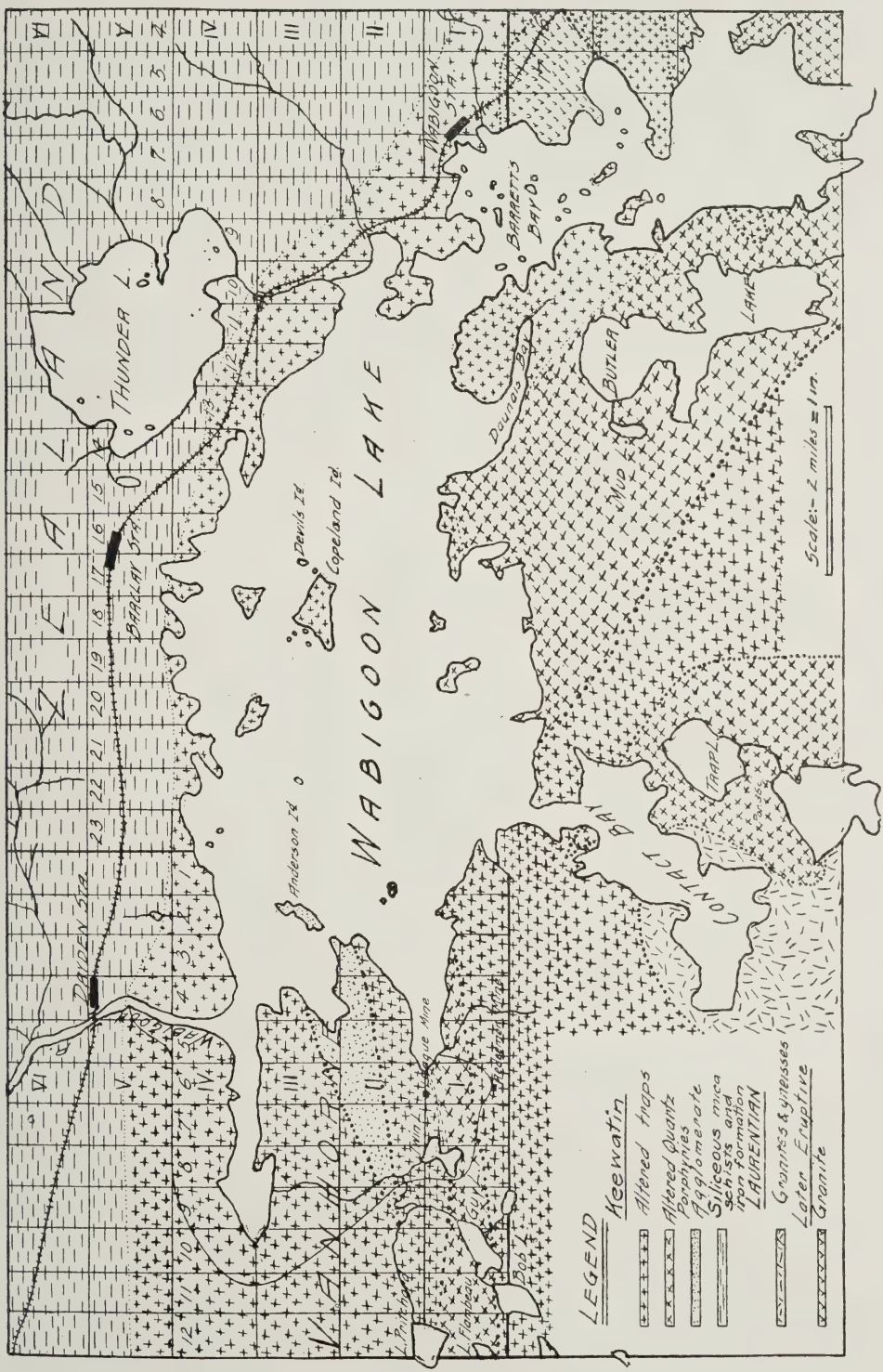


Plate No. 4.—Dryden area.

feet deep has been sunk, and a test pit about ten feet deep put down. The vein is about six feet wide and consists principally of quartz. About an eighth of a mile in a southerly direction from this vein a sample of the trap was broken and small scales of molybdenite found. The occurrence of molybdenite in trap is unusual, as this mineral seems to occur almost uniformly in acidic rocks. Inasmuch as this exposure is near the contact of the trap and granite it is quite possible that the presence of the granite has much to do with the presence of the molybdenite.

The Dryden Gold Belt

The geology of the region around Dryden has been worked out in a general way by Mr. William McInnes in the Manitou lake sheet of the Geological Survey of Canada. During the past summer our party went round Lake Wabigoon and Thunder lake, and upon comparing our results with those of Mr. McInnes, it was found that on the whole our work was in accordance with his so far as could be determined by an examination of the shores of the lakes. Some slight differences were naturally disclosed by our detailed work, and these are set forth in the map accompanying. (See plate No. 4). It was found that the extent of the altered quartz porphyries in the southern part of Van Horne township was not so great as has heretofore been supposed. It was also found that the body of altered quartz porphyries extended in an almost east and west direction in concession 1 of this township, and is bordered on the south by altered diabase and on the north by altered diabase and agglomerate. The agglomerate in this region is principally of the diabasic type, and it is somewhat uncertain just what limits should be assigned to it, but it is probably a much smaller area than is assigned by Mr. McInnes, and possibly a somewhat longer area than is represented in the present map. In the area covered by this map there are six distinct formations shown, which include a granite area near Wabigoon, an area of Laurentian granite and gneiss at the south end of Contact bay, several areas of diabase, altered quartz porphyry and agglomerate, and a broad band of schists containing a well developed deposit of magnetic iron which is mapped as iron formation. In studying the map around Contact bay it will be seen that the formation immediately adjoining Trap lake is marked as altered quartz porphyry, and so far as the formation was seen on Contact bay it represents the general truth, but there are a few small bands of altered diabase, and it would seem probable that these may have a greater development on Trap lake. The continuation of these bands of altered quartz porphyry is represented as a wedge-shaped mass on the northwest side of the bay. It is possible, however, that this extends further west to the south of Van Horne township. The gold mines in this region are located principally in concession 1 of Van Horne township, but a few claims have been taken up on Contact bay, and there is a well-defined vein in lot 5, concession 2, Van Horne, upon which work has been done.

The country round Wabigoon lake is of a rolling nature and as a rule the surface is covered with a deposit of clay loam, which appears to be decidedly sandy. This deposit of clay loam is banded, and apparently is the result of deposition of clay and silt in a large body of water at the close of the glacial epoch. In this banded clay are frequently found concretions of a calcareous nature, and at one or two places it was observed that there were considerable deposits of pebbles which may have been the gravel of an old stream or material deposited by a glacier. The entire area has a low relief, and has apparently been glaciated, though few, if any, glacial markings were observed.

Redeemer Mine

On the southwest forty acres of the south half of lot 6, concession 1, Van Horne township, is located the Redeemer mine. The mine is sunk on a vein consisting largely of quartz, but exhibiting in some parts a felsitic appearance. The shaft has been sunk 235 feet, and two levels have been opened up at 100 and 200 feet respectively. On the

first level drifts have been run 50 feet east and west from the shaft. There is also a drift 65 feet long on the second level. Upon our arrival the mine was filled with water, and was the sole source of drinking water for the camp, inasmuch as the continued drought had dried up all the streams and springs in the neighborhood. The shaft and mill are about 80 feet apart and are connected by a covered bridge leading from the top of the shaft house to the top of the mill. There are two boiler houses, one for the shaft, the other for the mill. The engine rooms are part of the shaft house and mill, and in this respect are a menace to safety because of the possibility of fire. The equipment in the shaft house consists of one boiler, one three-drill compressor, and one hoisting engine. In hoisting the ore a bucket is employed, and the ore is dumped into cars at the top of the shaft house and pushed over the bridge to the mill, where it is dumped on a horizontal grizzley, by which the fine material is separated and sent directly to the stamps, the coarser material being put through a Blake crusher before going to the stamps. There are 10 stamps which are manufactured by the Jenckes Machine Company, Sherbrooke, Que. After

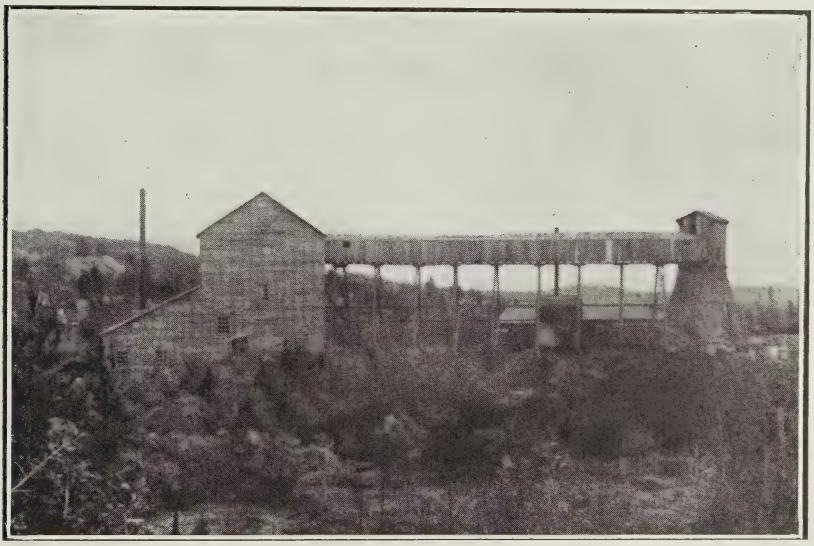


Fig. 21.—Redeemer shaft house and mill.

leaving the stamps the crushed ore is passed over an Overstrom concentrator. An experiment was made in cyaniding the ore, old barrels being used as cyanide tanks.

About the time our party left this section Mr. F. B. Roberts, manager of the mine, arrived and began the work of pumping out the mine. Before this could be done it was necessary to make some repairs to the boilers, and he estimated that it would be about a week before the second level would be opened, so that, in consequence it was impossible to go down in the mine.

The Redeemer camp is equipped with a comfortable boarding house, lodging house, and office for the manager.

Golden Park Claim

On the north side of Williams bay, in lot 5, concession 2, of Van Horne township, is a location known as the Golden Park, upon which two shafts have been sunk on a quartz vein about 6 feet wide. The vein is in trap and contains considerable pyrite and siderite as well as traces of chalcopyrite, malachite, and azurite. No work was being done at the time of our visit.

League Mine

The north half of lots 5 and 6, concession 1, Van Horne, are owned by the Shareholders Protective League, Limited. The principal openings have been made on lot 6, where two shafts have been sunk in an altered quartz porphyry which has developed a certain degree of schistosity and may be looked upon as a breccia. In this rock is a vein which varies considerably in texture, and seems to grade from a quartzite to a felsite. The first shaft sunk is 80 feet deep and is 7 x 9 feet. The second shaft upon which work was in progress is also 7 x 9 feet, and had reached a depth of 36 feet at the time of our visit. The equipment had been removed from the first shaft to the second shaft and consists of a boiler, and small hoisting engine. Mr. J. J. Kaighin is superintendent, and there were four men working.

Other Gold Claims in Van Horne

On the southeast 40 acres of the south half of lot 10, concession 1, Van Horne, a shaft has been put down on an irregular vein about seven feet wide. The country rock is diabase, but the vein is not far from the contact of diabase and altered quartz porphyry. In the vein are several horses, so that the width of vein material is probably not more than 3½ feet. At the time of our visit the shaft had been sunk about twelve feet. This claim is owned by Mr. Pitt, of Dryden, and the development work was being done by Messrs. A. McPhail and D. Hutchinson.

On the south 80 acres of the north half of lot 8, concession 1, Van Horne, is the Good Luck claim, which has been taken up by Messrs. A. McPhail and D. Hutchinson. Two veins have been exposed on this claim. The north one is about three feet wide and consists of banded quartz, siderite, talc and pyrite. The south vein is about three and a half feet wide. It shows considerable free gold, and at two spots on the surface of this vein the writer found visible gold. A test pit has been sunk here, and the samples taken out frequently show visible gold.

During the summer a forest fire swept over much of the Dryden gold belt, and the buildings at the Ideal mine were burned, so that nothing further can be added to the former reports on development of this property.

The Lone Jack claim is on Bob lake in the south half of lot 11, concession 1, Van Horne township, and upon the property there is a well mineralized vein about 15 feet wide, which is highly impregnated with pyrite. Several test pits have been sunk on the vein and some stripping has been done.

On A. L. 88, near Flambeau lake, is a promising vein, about 6 feet wide, of which about two feet is nearly pure quartz, while the rest consists of quartz and siderite. North of this vein is another one about eighteen inches wide. It is possible that the two veins may come together.

On R. 545, a test pit has been sunk in altered felsite which is cut by numerous quartz veins. Presumably this rock is the same formation as that found at the League mine, but the rock here is somewhat mixed, as in addition to the felsite there is considerable trap, so that it is apparently near the contact of the two. The test pit was nearly filled with water, and only surface indications could be observed.

North of Guy lake in lot 10, concession 1, Van Horne, Mr. J. R. Walker has sunk a shaft about 50 feet deep in an altered felsite or granite. The veins are small, being not more than about a foot wide, but it is reported that assays of samples from this claim have gone as high as $19.40. On the same claim are three large quartz veins running from two to six feet in width upon which shallow openings have been made but no shaft sunk.

The southwest 40 acres of lot 10, and the southeast 40 acres of lot 11, concession 2, Van Horne, have been taken up by Mr. H. A. C. Machin, M.P.P., and the development work has been done near the boundary of the two. A quartz vein about a foot wide shows on the surface, but decreases in width at a depth of about four feet.

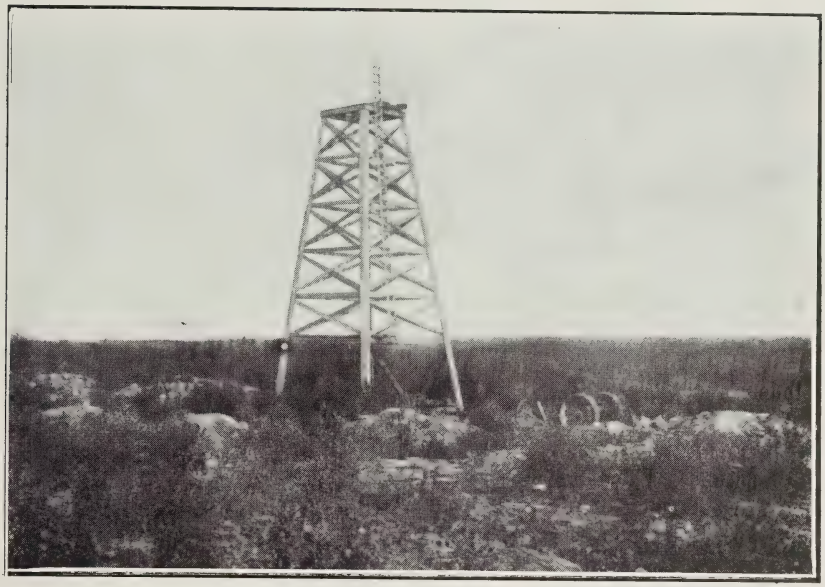


Fig. 22.—League mine, No. 1 shaft.



Fig. 23.—League mine, No. 2 shaft and boiler house.

On the northwest 40 acres of lot 11, concession 1, is a vein which has been stripped for about 100 feet. This vein is about 2 feet wide, and consists principally of quartz with some pyrite. The country rock is felsite with which is associated some diabase. The indications here are promising.

The vein at the Gold Moose mine is about 18 inches wide and a shaft has been sunk to a depth of about 60 feet. The vein is quartz in a country rock of trap. The mine was idle at the time of our visit.

On the northwest 40 acres of lot 7, concession 1, is a quartz vein which varies in width from one to three feet, which is near the contact of felsite and trap. Aside from a little stripping no development work was seen.

The Lost mine is owned by Mr. C. Larson, who has sunk two shafts about 300 feet apart to a depth of 22 and 54 feet respectively. The vein is at the contact of trap and felsite, and varies from 2½ to 6 feet in width, but occasional horses may be seen. The vein has been stripped for a considerable distance, and Mr. Larson reports visible gold in the quartz. The vein looks promising, and the development work has been well done.

In lot 5, concession 1, Van Horne, are two claims owned by Messrs. Hays and Campbell, respectively, upon which development work has been done by sinking test pits. In both cases quartz veins are found in trap, and these veins may possibly be an eastward extension of the Redeemer vein.

Several claims have been taken up on Contact bay, but the only development noticed was on the east side of the bay, and as no one was around it was impossible to ascertain the claim number. At the place where development work was seen two test pits from 20 to 30 feet deep had been sunk and some of the work had been done within a few days. The principal development work in this region has been done by Mr. J. Holmes.

Iron Ore

Between Dryden station and Thunder lake is a deposit of magnetic iron ore, which occurs about the middle of a deposit mapped by Mr. McInnes as "highly altered Keewatin rocks, principally mica, schists and fine gneisses." This formation, however, should undoubtedly be classified as iron formation. The width of the iron-bearing body about three miles east of Dryden varies from 100 to 200 feet, and consists of alternating bands of magnetite with quartz and some hornblende and mica. On the west side of Thunder lake a continuation of this same body of ore is found, and the deposit is said to be continuous for about two miles. The deposit is banded and in some portions highly contorted. A sample taken on Thunder lake shows alternating bands of quartz, magnetite and hornblende, with occasional traces of pyrite. The magnetite is very fine grained, and the ore has a lean aspect, but it is possible that by magnetic concentration a workable grade of ore can be obtained. The rocks accompanying the magnetite are principally mica schists which are more or less garnetiferous. Considerable quartz is present in these rocks. The contorted character of the ore body is rather striking (see fig. 25), particularly as the adjoining rocks have more uniform banding.

Molybdenite

Mr. C. D. Coates, of Dryden, showed the writer samples of molybdenite which were stated to occur in a pegmatite from a granite region south of Gull lake at a point seventeen miles northeast from Dryden. Several crystals were more than an inch in diameter.

Eagle Lake Region

The trip on Eagle lake was made with a view of examining the gold deposits in the southwestern part, so that little detailed work was done in other parts of the lake.



Fig. 24.—Iron formation, Dryden.



Fig 25.—Iron formation, Dryden.

The geology of this region has been worked out by Mr. Wm. McInnes in the Manitou lake sheet of the Geological Survey of Canada. In the main the geology as outlined by him coincides with the writer's conclusions, but on the large island south of Indian Reserve No. 27 the observations of the writer led him to designate the rock which is mapped as agglomerate, as altered felsite or quartz porphyry. Inasmuch as our party was without a copy of Mr. McInnes' map no examination was made on the east shore of the lake at this point to determine whether this rock might not be found on the main shore, as it was supposed that this outcrop was a continuation of the formation shown on the west side of Wabigoon lake, and it is almost in line between the altered felsites a short distance to the west on Eagle lake and those on the west side of Wabigoon lake. It is desirable that further investigations be made here to determine the relations.

Building Stone

The granite in the southwestern part of Eagle lake is well adapted for building purposes, but is open to the same objection that applies to the granites of Lake of the Woods, namely, there are no proper transportation facilities.

Iron Deposits

It was reported to the writer that iron deposits are to be found on Net island and North Twin island. An examination was made to find these bodies, but no trace of them could be seen, and although the dip-needle was used along the shores, no noticeable deflection was observed.

About a half mile south of Eagle river station, is an outcrop of banded schistose rock which is undoubtedly iron formation, but so far as seen it does not contain any great quantity of iron ore. This rock has been traced by Mr. McInnes eastward from this point through Dryden to Thunder lake and beyond.

Meridian Bay Mining Company

On the west side of Meridian bay of Eagle lake is located the property of the Meridian Bay Mining Company. Upon it is a vein extending nearly north and south, which is composed principally of pyrrhotite, chalcopyrite, and pyrite. The width of the vein varies from 3 to 12 feet, and Mr. J. E. Stanton, the manager, reports that it contains from one-half to one per cent. of nickel, in addition to copper and gold values. The vein has been stripped for about two hundred feet, and an opening about 25 feet long has exposed the vein for its full width to a depth of about 10 feet. A good sized pile of ore has been taken out and several tons have been roasted. The appearance of the ore is good, and in case more ore of similar character were found it would probably pay to work it for the copper content. The vein lies in a coarse diabase or gabbro. A comfortable camp has been erected here, and further developments will be watched with interest.

Grace Gold Mine

The Grace mine is located on the west side of Eagle lake near the contact of Laurentian granite and altered quartz porphyry of Keewatin age. Six veins have been located on this property and a shaft has been sunk 135 feet on what is known as No. 1 vein, and in this mine one level has been opened up. The vein is much the same type as those seen in the Manitou region, and consists principally of schists with some bluish quartz. In addition to the shaft a tunnel has been driven into the hill 160 feet. A stamp mill has been erected, the equipment consisting of a Blake crusher, five stamps, an engine, one boiler, two vanners, and a small hoisting engine. A well equipped camp has been provided for the comfort of the workmen. The mine was idle at the time of my visit, but it is in charge of a caretaker who made our party very comfortable during our stay.

Baden-Powell Mine

The Baden-Powell mine of the Northern Light Mines Company is located on South Twin island in the western part of Eagle lake. The country rock here is granite, probably of Laurentian age. Three quartz veins are visible on the surface and test pits have been sunk on all of them. A shaft has been put down 135 feet.

A stamp mill erected on this property has for its equipment a Blake crusher and five stamps, with amalgamating table, a boiler and an engine. At the shaft a small hoisting engine with an 18-inch drum brings the ore to the surface, and a tramway connects the mouth of the shaft with the top of the mill. The property was not working at the time of our visit.

Eldorado Mine

On claim M.H. 257 is located the Eldorado mine, owned by the Northern Light Mines Company, whose head office is located at 628 Prudential Building, Buffalo, N.Y. This claim is on the west side of Eagle lake in an area of Laurentian granite. A shaft has been sunk, but as considerable water was in the shaft and no one was on hand to give any information, it can only be said that the prospectus of the company states that it had been sunk twenty feet, but the amount of waste rock would indicate that the shaft was deeper. A mill has been erected near the shaft which has a gyratory crusher, two gravity stamps, and an amalgamating table, one boiler, one small hoisting engine, one engine for crusher, and a pump.



Fig. 26.—Grace mine, Eagle lake.

Pyrrhotite Deposits

On account of the discovery of pyrrhotite south of Ingolf, our party went to this place in company with Mr. H. P. Thomas of Kenora, and made a hasty examination of a few claims. The pyrrhotite runs in two or more parallel bands nearly east and west, and is found extending from a point two or three miles east of West Hawk lake to a point several miles west of the west end of the lake. Much of the rock with which the pyrrhotite is associated is schistose and resembles the iron formation near Dryden, except that the iron present is combined with sulphur rather than oxygen. The width of

the pyrrhotite bodies varies considerably, but in one place east of West Hawk lake the main body was about 150 feet wide, while the rock accompanying it appears to be well impregnated with it for a width of several hundred feet, as evidenced by the rusty character of its outcrop. This body of pyrrhotite carries gold values; nickel has been looked for, but up to the present only very small percentages of this metal have been detected by analysis.

The writer wishes to acknowledge the many courtesies and favors which were extended to him during the summer. It is impossible to mention each one individually, as this would involve making a list of nearly all with whom he came in contact. He would, however, make particular mention of H. A. C. Machin, M.P.P., of Kenora, who not only extended hospitality to the party before our equipment was ready, but took us in his launch to the Mikado and Regina mines. Mr. Dryden Smith, manager of the Detola mine, not only moved our camp equipment for us twice, but assisted in locating many of the claim lines, and rendered many other favors which were much appreciated. Mr. Dixon, of Dryden, who transported us from Minnehaha lake to Dryden, rendered us a favor which is remembered with gratitude. Finally, the advice and criticism which have been given by Prof. A. P. Coleman of the University of Toronto are acknowledged with thanks.

VERMILION LAKE PYRITE DEPOSITS

BY E. S. MOORE

Introduction

The Vermilion Lake pyrite deposits are situated in the vicinity of Big Vermilion lake. During the past summer the writer, in accordance with instructions received from the Provincial Geologist, prepared a report upon the geological features of these deposits. Accompanying the report is a key map of the region, showing the relative position of the several deposits, concerning the location of which information could be obtained, and a map on the scale of 40 chains to the inch covering the area in the vicinity of Vermilion pyrite mine. Owing to limited time a larger map of the Vermilion lake region was not prepared, and those desiring further information than that given on these maps are referred to the large map of this region published by the Department of Mines at Ottawa.[1]

Owing to the thickness of the drift great difficulty was experienced in working out the rock relationships in the vicinity of the Vermilion mine, as it was only where development work had been done that the deposit was exposed. The deposit at this mine is the only one upon which a large amount of development work has been done, and it gives promise of being an important producer of iron pyrites for the manufacture of sulphuric acid.

It is matter for regret that the officials in charge of the Vermilion mine could not see their way clear to give, for publication, quite as much information about the property as was desired, yet I feel highly indebted to Mr. H. V. Smythe, superintendent of the mine, and other members of the mine staff, for their cordial hospitality and assistance while engaged in work in that vicinity.

Geographical Position and Extent of Pyrite Area

Vermilion lake, or Big Vermilion lake, as it is often called, lies about five miles southwest of the new village of Graham, on the National Transcontinental railway. It was formerly reached from Dinorwic, about 35 miles distant, on the main line of the Canadian Pacific railway, by a wagon road and canoe route, but at the time of my trip we travelled by canoe from Superior Junction, although the new railway line passes within about three miles of the lake and is at present connected by an aerial tram. Our route lay down the Sturgeon river to Abram lake, through this and Pelican lake and thence up the river to Vermillion lake. The canoe route is good, as the current in the Sturgeon river is slow, and the only rapids or falls met with are Frog Rapids (which are almost negligible), at the outlet of Abram lake, a rapid about 300 yards long in Vermilion river up which we towed the canoes, and Vermilion Falls with a drop of about ten feet, necessitating a very short portage. When the Vermilion river is low there is barely enough water for canoe travel below the falls. On this trip the rocks observed were chiefly green schists, greenstones and granite, but a fine outcrop of Lower Huronian conglomerate (Fig. 1), was seen along the north shore of Abram lake, nearly opposite "Abram's Chute." The rock contains large granite boulders, some as much as 18 inches in diameter and well rounded. There are also greenstone, vein quartz and iron formation pebbles. The rock is considerably sheared and many of the pebbles are elongated.

Vermilion lake is about 15 miles long and a maximum of three wide, and has many islands scattered through it. One fails to see the appropriateness of the name, as the water is beautifully clear, and the gossan on its shores is not at all striking.

The accompanying map will show the relative position of the various pyrite deposits. The most important one, the Vermilion Pyrite mine, lies at the east end of the lake, while the other bodies were found between this mine and Pelican lake and on an island near the west end of the lake. The latter deposit is about 8 miles west of

[1]Explored Routes in a Portion of Northwestern Ontario between Lake Minnitaki and Lake of the Woods, Dept. of Mines, Canada, 1909, Map No. 1061.

the mine, but it is suggested that it may be along the same general line of fissuring as the vein at the mine, because its projection would lie along a line near the mine and along the general strike of the rocks in the vicinity.

Although in two reports[2] a deposit of pyrite is mentioned as occurring on the shore of Vermillion lake, about eight miles west of the mine, nothing is said about an island, and it is thought that the vein on this island may be the one to which reference is made, as no information was received from the Mining Recorder or the officials at the Vermilion mine regarding any deposit located on the shore. The deposit is called the Fanning prospect by Fraleck. An observation of the accompanying maps will show that all the deposits occur within a narrow area, which is about 12 miles in length.



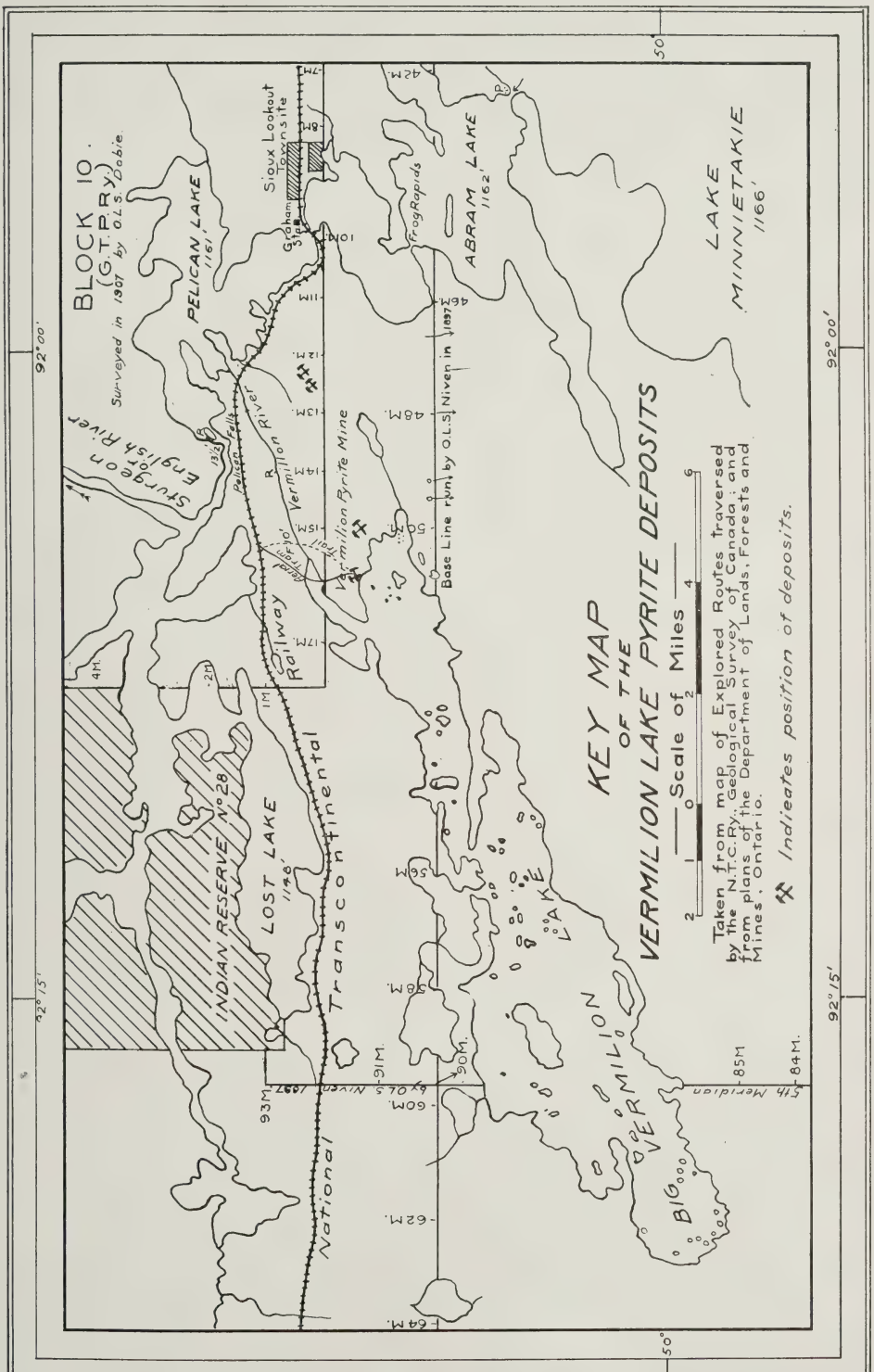
Fig. 1.—Lower Huronian conglomerate, Abram lake.

Historical Geology of the Area

Rocks of the Area

The rocks in this area consist of a complex of indefinite age, since there is no fixed geological horizon by which the ages of the various formations can be determined. This complex consists largely of greenstone, often showing pillow or ellipsoidal structure, and green schists frequently of indefinite origin, but derived from basic igneous rocks, and apparently graywackés and arkoses. Plagioclase feldspar-porphyries may be seen with phenocrysts one-quarter inch in diameter. A large mass of diabase occurs along the footwall of the pyrite deposit at the Vermilion mine, and although portions of this rock are much weathered some of it appears much fresher than the bulk of the greenstones in the region. Narrow bands of recrystallized cherty iron formation interbanded with black graphitic slates occur along the south bank of the Vermilion river

[2] Iron Pyrites in Ont., E. L. Fraleck, Bur. Min., Vol. XVI. (1907). p. 177, and W. H. Collins, Region between Lake Nipigon and Clay lake, Ont., Dept. of Mines, Canada, 1909, pp. 61-2.


KEY MAP
OF THE
VERMILION LAKE PYRITE DEPOSITS
Scale of Miles
Taken from map of Explored Routes traversed by the N.T.C.Ry. Geological Survey of Canada; and from plans of the Department of Lands, Forests and Mines, Ontario.
Indicates position of deposits.
BLOCK 10
(G.T.P.Ry.)
Surveyed in 1907 by O.L.S. Dobie
PELICAN LAKE
1161'
Sioux Lookout
Townsite
Graham
Station
Frog Rapids
ABRAM LAKE
1162'
LAKE
MINNIETAKIE
1166'
Sturgeon
or
English River
Pelican Falls
R. Vermilion River
Vermilion Pyrite Mine
Base Line run by O.L.S. Niven in 1897
INDIAN RESERVE No 28
LOST LAKE
1148'
Transcontinental
Railway
National
VERMILION
LAKE
BIG
92° 00'
92° 15'
50°
93M.
91M.
90M.
89M.
88M.
87M.
86M.
85M.
84M.
64M.
62M.
60M.
48M.
42M.

and along the north side of the deposit at the mine. What appears to be a narrow band of metamorphosed sandstone occurs near the hanging wall, and fragments of it may be seen on the dump.

The rock forming the hanging wall of the mine and stretching away to the east is a schistose basalt-breccia, composed of fragments of very fine-grained basalt, cemented by quartz and calcite. The fragments now consist chiefly of uralite and zoisite, secondary minerals due to alteration of the primary ones, augite and calcium sodium feldspar.

On Pelican lake, at the eastern extremity of the area, there is a large mass of epidote-granite, extending west into the most easterly of the nineteen claims surveyed in this area. It is a very handsome granite, of a reddish color, with yellowish-green specks of epidote scattered through it.

As it is impossible to definitely fix the age of these various rocks, the greenstones, schists and iron formation are tentatively regarded as Keewatin in age, and the granite as Laurentian, *i.e.*, post-Keewatin and pre-Huronian, although its massive character and other resemblances to some later granites further east suggest a later age for it. The quartzite and diabase may be Huronian, in which case the granite would be regarded as post-Huronian.

Outline of Geological Events

The series of geological events which are supposed to have occurred in this area include extensive volcanic activity, producing the intrusive and extrusive basic and acid rocks. These rocks include the ellipsoidal greenstones, diabases and quartz-porphyries. The diabase along the footwall of the mine may have originated at this time or later. On top of these rocks were laid down small amounts of cherty iron formation, with black slate, arkose, graywacké, and later a little sandstone.

These rocks all suffered extensive metamorphism and the schists resulted.

Following, or perhaps accompanying, this metamorphism, occurred the intrusion of the granite, and although this cannot be asserted with any degree of certainty, it is thought that the solutions bearing iron and sulphur may have entered fissures formed at this time along lines of weakness between different masses of the earlier rocks, as, for example, between the diabase and the basalt-breccia, which was probably formed by crushing at the time the fissure was developed. The reasons for the supposition that this was the sequence of events will be discussed under the heading, Genesis of the Pyrite.

The question of the relative age of the pyrite and a large quartz vein which cuts through it in the mine and runs off through the schists about one-third of a mile to the east is difficult to settle. In view of the fact that vein quartz is associated with the pyrite not only at the mine but in the band of iron formation lying along the south side of Vermilion river, in the small deposits on claims H.W. 778 and 779 and on the island in Vermilion lake, as well as in the deposits in many other places in Ontario, it seems reasonable to regard it as a gangue mineral with the pyrite, having been deposited at the same time. It is found, however, that at the mine the quartz forms a more or less tabular mass about 12 feet wide, cutting through the centre of the sulphide body, and it fills small cracks in the pyrite, as if fracturing of the pyrite permitted the infiltration of the quartz. As crystals of pyrite and a little sea green talc also occur in these cracks with the quartz, it may be that the quartz and pyrite in them represent small amounts which have been taken into solution and re-deposited along these lines.

The presence of the quartz vein in the central portion of the pyrite body might be explained on the supposition that the quartz formed early in the process of vein filling, and that the fissure later widened, permitting the pyrite to come in on either side. A parallel interbanding of pyrite and schist along the north side of the deposit suggests this re-opening of the fissure.

Further evidence regarding the relation between the pyrite and quartz may be found in the basalt-breccia along the hanging wall of the deposit. The fragments of



Fig. 2.—Big Vermilion lake from Vermilion pyrite mine.



Fig. 3.—Granite dike in greenstone near Pelican lake, G.T.P. Ry.

the breccia are cemented by calcite and quartz, and there is a little pyrite with them. That there is not more pyrite may be due to the fact that these spaces were early filled with quartz and calcite before the stronger pyrite solutions appeared, or this breccia may not have been formed until a later time and perhaps at the time the quartz vein was formed. Further work in the mine may throw more light on these relations.

Description of the Various Deposits

Vermilion Pyrite Mine

This property is the only one which has been worked. It includes the claims H.W. 715 and 716, purchased from J. Shilton, and lies on the eastern shore of Vermilion lake. It was discovered a good many years ago by a prospector observing the red gossan on an outcrop of pyrite and pyrrhotite on the edge of the lake, the only place where it outcropped, because of the thickness of the drift in this vicinity.

The mine has been known by various names, such as the Michie mine, the Northern Pyrites and the Vermilion Pyrite mine. It is controlled by the General Chemical Company, which also controls several mines in eastern Ontario, and which has sulphuric acid manufacturing plants at Detroit, Michigan.

Mine Workings

The workings at the mine have been described by several writers, E. T. Corkill, Mine Inspector,[3] E. L. Fraleck,[4] and W. H. Collins.[5] Messrs. Corkill and Collins regarded the deposit as a true fissure-filling, while Mr. Fraleck considered it as a replacement in the schist. The former determination seems to be the correct one.

These workings consist of two shafts, No. 1, in the hanging wall, about 250 feet, and No. 2, on the footwall, 230 feet deep. The former is a vertical shaft, the latter follows the dip of the rock at about 65° north. In No. 1 there are levels at 85 feet and 145 feet. At the first level, the point where the shaft struck the pyrite, a cross-cut has been driven south 74 feet across the deposit, and at the second level the cross-cut south to the footwall is 65 feet and north to the hanging w. 16 feet. On the second level there is a drift east 175 feet and west 50 feet. On the footwall side of the vein a drift runs east 110 feet and west 30 feet.

No. 2 is a two-compartment shaft lying to the east of No. 1 and connected with it by a drift 400 feet long. At the time of my visit a cross-cut had been run north 30 feet across the vein and a short drift east along the footwall. All the cross-cuts and drifts mentioned above lie in pyrite, and there is already blocked out a large mass of the sulphide. Above the second level there is a large stope, from which it is said 10,000 tons of pyrite were taken out in 1909, and shipped by the aerial tram which connects the mine with a spur on the Transcontinental railway about two miles distant. No shipping is being done at present, and the property is being developed by underground work and storing of the material in dumps on the surface, since the bins at the railway track collapsed about a year ago.

On the surface pyrite is disclosed in pits 400 feet northeast of No. 1 shaft, 150 feet southwest and again about 350 feet southwest at the shore of the lake. Mr. Fraleck states that borings in the lake 200 feet from the shore are said to show high grade sulphide.

The Sulphide Body

The term "ore-body" has frequently been used in speaking of this deposit, but it seems scarcely appropriate since no metal is extracted from the mineral. Some of the iron from the Spanish sulphides is used in blast furnace work, probably because they contain some copper, and where copper is present it is easier to get rid of the sulphur, but our native sulphides do not appear to be used in the manufacture of anything but sulphuric and other acids.

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[3]Bur. Min., Vol. XVIII. (1909), p. 83; also Vol. XIX. (1910), p. 79.
[4]Ibid., Vol. XVI. (1907), p. 176.
[5]Dept. of Mines, Canada, Lake Nipigon to Clay Lake, 1909, pp. 61-2.



Fig. 4.—Vermilion pyrite mine as seen from Vermilion lake.



Fig. 5.—Vermilion pyrite mine from hill southeast of the mine.

From the outline given above of the development work at this mine it is evident that there is a very large body of sulphide blocked out. The mass is comparable in purity and extent to some of the large sulphide bodies in the Sudbury region. It lies between a clear-cut footwall of old diabase, which is fairly regular in outline, and a hanging wall of schist, composed chiefly of a brecciated basalt. Narrow bands of schist are in some cases interbanded with the pyrite, but on the footwall there is little pyrite in the country rock. The main mass of the deposit is nearly pure pyrite, with a little pyrrhotite in places and some sulphide, which is lighter in color than most pyrite and may be marcasite, but on account of being massive its crystal form could not be determined. The analyses are said to show from 45 to 48 per cent. S, which is a little below the theoretical percentage in pyrite (53.4 per cent.).

Mr. Smythe, the superintendent, said he did not know whether the ore contained any gold or not, as he had not had analyses made to determine the presence or absence of this metal.



Fig. 6.—Vermilion pyrite mine, No. 1 shaft house and dump.

Near the centre of the vein there is a mass of quartz about 12 feet wide mixed with the pyrite. This same vein may be seen on the surface about 400 feet northeast, where it is about four feet wide. A little sea-green talc and chlorite occur along cracks in the pyrite, with crystals of quartz and pyrite.

The vein is wider at the west end of the working than at the east, and this may indicate a pinching in that direction, but on account of the drift nothing can be determined on the surface regarding the size of the vein. In depth the deposit holds its width well so far as the development work has gone.

Oxidation of Pyrite

The oxidation process in pyrite is well illustrated on the dump at the mine. Where a pile of crushed pyrite has stood for a couple of years large masses have altered, under the action of rain water, to melanterite, the hydrous, ferrous sulphate of iron ($Fe\ SO_4 + 7\ H_2O$), which is readily recognized by its astringent taste. It occurs in greenish and grayish-white colors, and when mixed with the red oxide gives yellowish and reddish hues. The oxidation has extended to a depth of four or five feet in the pile and botryoidal and rudely stalactitic forms of the sulphate have resulted where the material overhangs.

Other Deposits of Pyrite

Besides the Vermilion mine there are other deposits which are of lesser importance. On the south shore, near the point where the aerial tram crosses the bay on Vermilion lake, there is some pyrite in a banded sugary quartz and black slate, which is regarded as metamorphosed iron formation. The pyrite here is distinctly later than the iron formation, and is accompanied by vein quartz. It is of no importance economically.

Tindall's Claims

On the east end of an island in Vermilion lake, about eight miles west of Vermilion mine, there is a deposit of pyrite on what is known as Tindall's claims. On this island there is a pit upon a hill a few rods from the shore, in drift about 15 feet thick. In the bottom of the pit there is a vein about two and a half feet wide, composed of nearly solid pyrite. On the south side of the vein the rock is a schistose quartz-porphyry, containing small crystals of pyrite. The rock on the north side could not be determined, because of its altered condition and the drift cover. The drift overlying the pyrite is stained and cemented with iron oxide. In a hole in the drift, about four feet from the bottom, a decomposed boulder of vein quartz and finely disseminated manganese dioxide was found. The result is a dark granular mixture of silica and pyrolusite.

At the stripping on the lake shore the pyrite vein varies in width from three to four feet, but is not so pure as in the first pit mentioned. It carries some quartz, and cuts the schistose quartz-porphyry in such a way as to leave no doubt of its vein character. The strike of the vein is about 80 degrees, and this strike would carry it near the small island to the east of the one upon which the vein is seen. No pyrite was found in place on this small island, but some iron-stained schist and a block of pyrite more than one foot in diameter were seen on the south shore. A further projection of the vein would carry it somewhere near the Vermilion pyrite mine, and it is possible that the two veins are located along the same general line of fissuring. It will be interesting to see whether future prospecting will disclose any deposit on a line between these two.

Pits on Claim H.W. 762

Lying close to the winter road near the southwest corner of H.W. 762 there are four pits in the drift. The drift is stained with gossan, but no pyrite of importance was seen in place. In one pit a little banded quartz and magnetite was seen. These pits are located near the edge of the basalt-breccia, but are not considered to be in the same line as the vein at the mine, since the strike of 50 degrees, common to the rocks there, would carry the projection of the vein north of these pits.

The Schmidt Claims

We were informed that several claims in the eastern part of the group are owned by a Mrs. Schmidt. On claims H.W. 778 and 779, the next claims east of H.W. 762 which show any pyrite, there are some pits and trenches. The pit on H.W. 778 is about eight feet deep and runs into the side of a hill. The sulphide consists chiefly of pyrite, with a little pyrrhotite. In spots the pyrite is almost solid, but in other places it is much mixed with rock, either greenstone or altered quartz-porphyry, and an altered granite dike about one foot wide is associated with the deposit. It looks as if the sulphides, accompanied by a granite dike, had come in along a line of weakness between the acid and basic rocks.

The pit on H.W. 779 is situated, with reference to the last pit described, on a line along the strike of the rocks. This pit is three feet deep by five feet in diameter and located on a mass of pyrite in a schistose quartz-porphyry. Neither of these deposits has yet shown any claim to economic importance.

Genesis of the Pyrite Deposits

In looking over the descriptions of iron pyrite deposits in Ontario, Spain and parts of the United States, one finds that the deposits occur generally along contacts between schists and massive igneous rocks, along contacts between igneous rocks, acid or basic, and crystalline limestone, or as bands in banded iron formation, consisting of cherty silica and pyrite. Associated with the pyrite the chief impurities are calcite and quartz, in small quantities. Almost all of these occurrences, except the latter, suggest fissure fillings or replacements along a line of fracturing or faulting, but the source of the sulphide is very often not evident.

On Vermilion lake the pyrite seems to be deposited (1) at the Vermilion mine, in a fissure along a brecciated contact between diabase and basalt-breccia, (2) on the island in the lake and on claim 779 in fissures in schistose quartz-porphyry, (3) on claim 778 at the contact between quartz-porphyry and greenstone and in association with a granite dike, (4) on Vermilion river, with vein quartz in iron formation, consisting of banded silica, magnetite and black slate. That the pyrite is later than the iron formation in the latter case and its origin is independent of it is seen from the fact that the black slate has been crushed and fragmented and the pyrite fills the cracks and often surrounds the fragments. It is probable that this rock was easily fractured and served as a favorable channel for the ascension of the pyrite-bearing solutions.

As to the source of the pyrite, nothing definite can be said, as there is no igneous rock associated with the deposits in such a way as to give definite evidence for regarding it as the source. However, on account of the frequent occurrence of smaller masses of pyrite where granite intrudes Keewatin schists in other regions, and of a large amount of pyrite in the veins and granite which is supposed to be the source of the vein material in the Sturgeon lake area, it is suggested that the granite in this area may have been the source. It is thought that the magma which furnished the material for the granite at the eastern border of the pyrite-bearing area may have been responsible for the fracture zone extending westward from the granite, and may have been the source of the sulphides which rose in solutions along the lines of fracture. The presence of the granite dikes in association with the small deposits in the eastern portion of the area, and the extent of the distribution of the deposits, seem to favor the granite as the source, because some source of extended distribution is necessary, and there is good reason to believe that the granite in subterranean form is much more widely distributed than surface exposures would indicate, although it occurs on the surface both east and west of the deposits.

Petrography

Basalt-Breccia

One of the most interesting rocks seen in the area was a basalt-breccia, occurring along the north side of the pyrite deposit at the mine. In the hand specimen this rock is made up of fragments, usually elongated and often splintery, or with circular cross-section. The fragments look very hard and almost cherty in some cases, but in others more like a fine-grained greenstone, and they can be found grading over into solid, fine-grained greenstone. The spaces between the fragments are filled with calcite and a little quartz. In places large crystals of feldspar, about three-quarters of an inch in diameter, with good cleavage faces and colorless to grayish brown may be seen. The arrangement of the schist around the crystals gives it a sort of augen structure.

In the thin section the angular fragments are found to consist almost entirely of uralite, zoisite and secondary quartz, these being the alteration products of basalt. The spaces are filled with calcite and a little quartz and pyrite. The feldspar is plagioclase, and from the presence in it of so much zoisite as a secondary product and the extinction angles on (010) it is identified as anorthite. The mineral shows some recrystallization, with fresher feldspar in parts of the crystal, and this is believed to represent a growth of the crystal by the addition of secondary material deposited under metamorphic action.

Iron Formation

Several specimens of banded silica and magnetite and silica and graphitic slates were taken. The black slates are frequently crushed, and have the pyrite arranged along the cracks and surrounding the fragments so as to show the later origin of the pyrite. The silica consists of small interlocking grains like chert which has been crystallized under metamorphic processes. Bands of magnetite frequently occur in the silica.

Epidote Granite

An attractive granite occurs along the railway track near Pelican lake. It is medium fine-grained, pink in color, with yellowish green specks of epidote. It forms many dikes in greenstone, as may be seen in the railway cuts, and frequently contains inclusions of greenstone and schist. In thin section it is found to contain orthoclase, a little microcline and albite, a little dirty green hornblende, considerable epidote and much quartz. The rock has been metamorphosed, as some parts are granulated and most, if not all, of the epidote appears to be secondary.

Other rocks of the region are altered greenstones and acid rocks, and a few of apparently sedimentary origin.

APPENDIX : REPORT ON THE TIP TOP COPPER MINE

BY E. S. MOORE

Introduction

A geological examination of the Tip Top Copper property was made during the latter part of the field season of 1910. This property includes locations K 62, 63, 64 and 65, but the last was the only one upon which any ore was observed and any development work done. My work was, therefore, confined to the investigation of the mine and its immediate vicinity.

The mine camps are situated on the east shore of Round lake, and the shafts a short distance to the east of it. This lake is reached by a walk or drive of 1¾ miles from Kashaboiwe station, on the Canadian Northern railway west of Port Arthur, to lake Shebandowan, followed by a nine-mile gasoline-launch trip on this lake and a walk of four miles between lake Shebandowan and Round lake. About the year 1902 a government wagon road was constructed from Kashaboiwe station, a distance of 8 miles, to Round lake, but this is not much in use at present, as no work is being done at the mine aside from clearing and cleaning up the property, although a watchman is kept constantly on the ground.

I wish to express my indebtedness to Colonel Ray of Port Arthur, owner of the mine, for his hospitality during my visit to the property.

History of the Mine

This property has been mentioned a number of times in the Bureau of Mines reports, the first references being by Coleman and Blue in Vol. V, 1895, p. 75. Since that time notes have been made by Professors W. G. Miller and W. L. Goodwin, and by Messrs Fraleck and Carter, and there has been considerable difference of opinion regarding the nature of the country rocks associated with the deposit.

A good deal of work has been done on the property, and although the shafts were full of water and could not be inspected at the time of my visit, Colonel Ray informed me that No. 2 shaft was 50 feet deep with a drift north 50 feet and one south 102 feet. Shaft No. 1 is 200 feet deep with drifting at 50-foot levels, and a drift runs west 60 feet and east 150 feet. A cross-cut also runs north 100 feet. Mine Inspector W. E. H. Carter states that in 1903, 4,000 tons of 8 per cent. ore were raised.

A small smelter was purchased and it was intended at one time to instal it, but the lack of transportation facilities and a fall in the price of copper are said to have been responsible for a cessation of mining operations.

Geological Relationships at the Mine

The accompanying sketch map (page 211) will indicate better than any description the geological relations at the mine. The greater portion of the rocks in this vicinity are greenstones, consisting of altered basic porphyries and fine grained diabase with green schists derived from these and similar rocks. These greenstones and schists lie as ridges on the north and south sides of the deposit and enclose it. Some of the schists penetrate the deposit in a way which makes their relations very uncertain and complex, and it is believed that these relations have been partly due to folding and partly to faulting, although no definite fault planes were observed. The general strike of the rocks varies from about 90° to 100°, being thus almost east and west.

Across the northwest corner of K65 and extending farther to the northwest there is a large mass of quartz-porphyry, or possibly altered rhyolite, which is believed to be later than the greenstones. The greenstones and quartz-porphyry are probably Keewatin in age.

After the quartz-porphyry was formed it is believed that a large mass of quartzite was laid down and a portion of it, about 250 feet wide and a quarter of a mile long, has been preserved from erosive agencies by being folded into a syncline in the schists. Concerning the determination of this rock as a quartzite, there has been much difference of opinion. Dr. Coleman speaks of the deposit as a fahlband, evidently considering the silica to be in the form of vein quartz[1], Professor Miller says that what has been called chalcedony appears to be very fine-grained aphanitic felsite or quartz-porphyry[2]; while Professor Goodwin calls it a quartzite[3].

Much of this rock looks like chalcedony, and from an examination of a number of thin sections and a study of the rock in the field the writer has concluded that it is a quartzite which has been greatly metamorphosed by processes which folded it and produced the green schists, and by the intrusion of quartz-porphyry dikes accompanied by hot solutions. So highly metamorphosed is the rock that the grains are in many cases intergrown as the crystals in a quartz vein, and vein-like streaks through it look like portions of the rock which have been taken into solution and precipitated in the form of vein quartz. That the determination of this rock is important is evident from the fact that the depth to which the rock extends will depend somewhat upon whether it is a fissure-filling or a sedimentary rock folded into the schists. It is probable that in the widest portion of the syncline the quartzite extends to a good depth, as the dip is at a high angle.

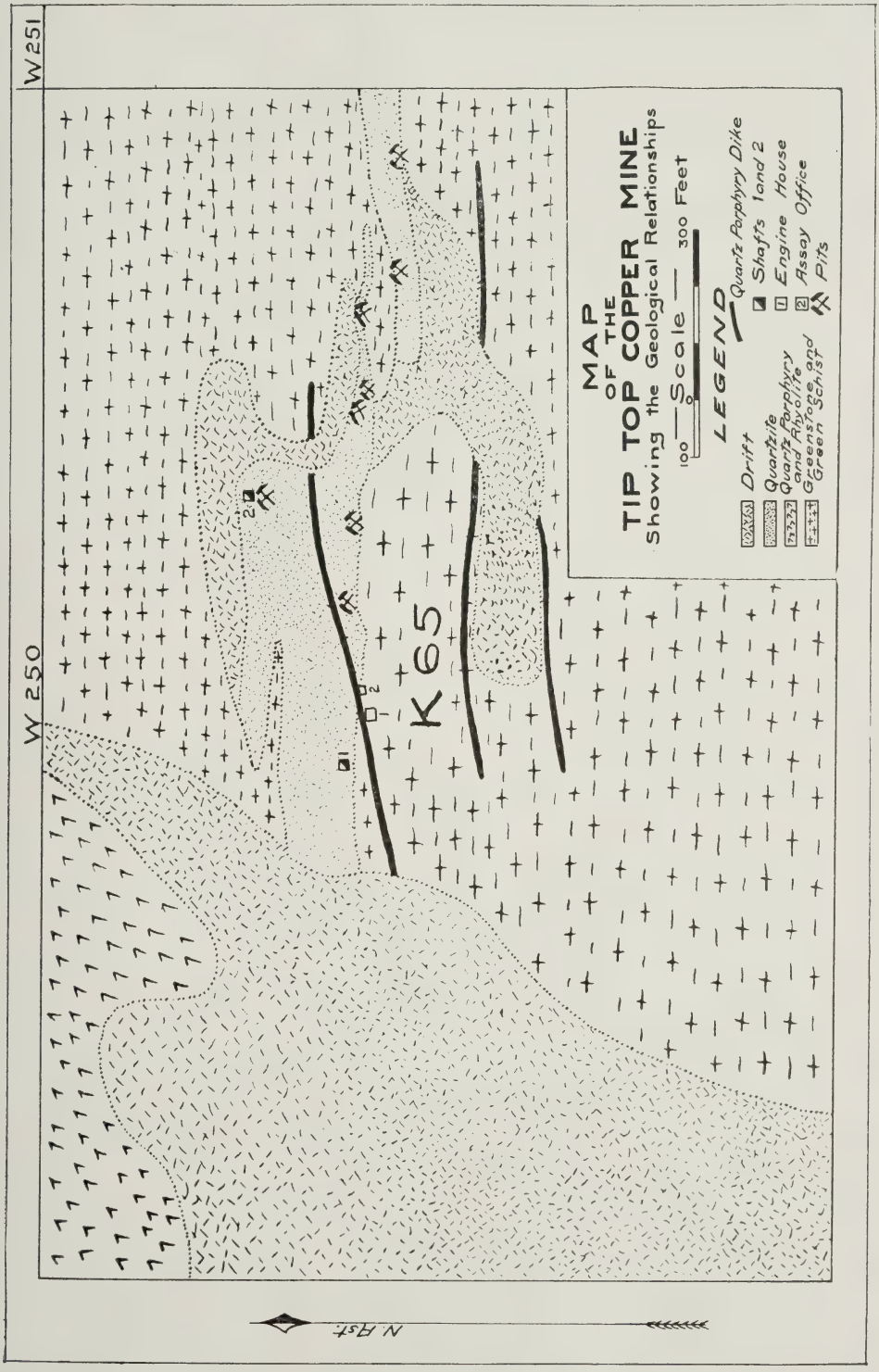
This quartzite is probably Huronian in age, and it has been intruded by some old quartz-porphyry dikes which are now almost altered to sericite schists. Still later than these old dikes are some comparatively fresh, flesh-colored, quartz-porphyry and felsitic dikes which are believed to have been responsible for the origin of the ore.

The ore occurs disseminated in these dikes and in the quartzite where it has been replaced near them, as well as along the contacts between quartzite and green schists and quartzite and sericite schist dikes.

Character, Occurrence and Origin of the Ore

Character of the ore:—The ore at the mine consists of chalcopyrite with small quantities of its alteration products, malachite, bornite and limonite. There is not much gossan to be seen. E. L. Fraleck's analyses of some of the gossan yielded iron 52 per cent., S. 0.45 per cent. Accompanying the chalcopyrite there is a great deal of iron pyrite and some pyrrhotite. The greenstones and the green schists of the vicinity as well as the quartzite, especially in local areas, carry considerable pyrite disseminated through them. The pyrite is much more common than the chalcopyrite in the greenstones and schists, the latter sulphide being confined to the quartz-porphyry dikes and quartzite or the contact zone in the schists. It is probable that much of the pyrite is

[1]Bur. Min., Vol. V. (1895), p. 75. [2]Ibid., Vol. XII. (1903), pp. 101-2. [3]Ibid., Vol. XIII. (1904), p. 56.


W 251
W 250
K 65
MAP
OF THE
TIP TOP COPPER MINE
Showing the Geological Relationships
100 — Scale — 0 300 Feet
LEGEND
Drift
Quartzite
Quartz Porphyry and Rhyolite
Greenstone and Green Schist
Quartz Porphyry Dike
Shafts 1 and 2
Engine House
Assay Office
Pits
N East

of earlier age than the chalcopyrite, though large lenses of the former occur associated with the latter. In his report on Iron Pyrites in Ontario[4] Fraleck says that there are large masses of pyrite in this mine running 40 per cent. in S. and suitable for the manufacture of H_2SO_4, were it not for the cost of mining and shipping. Siderite is widely disseminated through the quartzite, especially along the cracks in the rock.

Besides the minerals mentioned, Mr. Goodwin states that a mineral carrying cobalt and which is probably smaltite, was found and also that the ore carries values in gold and silver[5]. In the same report W. E. H. Carter states that a steel-gray mineral containing 2 per cent. cobalt had been found. Coleman mentions a green silicate which was reported to contain nickel, but the analysis which he had made did not reveal any of that element[6].

The mineralized area is large, but workable ore is confined to local areas where in some cases large masses of ore are said to occur. The ore is, on the average, low grade, and while the writer was unable to investigate the ore bodies in the shafts, on account of the water not being pumped out, he believes that the geological conditions are favorable for the production of a considerable quantity of ore.

Occurrence:—The accompanying map shows that No. 1 shaft and most of the test pits, which are in the majority of cases located on the most promising portion of the deposit, occur in the quartzite, either near the contact between the schists or greenstones and the quartzite, or near the late quartz-porphyry dikes. In shafts 1 and 2 one of these dikes is encountered in the workings and bodies of ore occur near it. Smaller masses of disseminated ore occur along some of the older quartz-porphyry dikes which cut the quartzite, but which are now nearly altered to sericite schist. No strong ore body occurs immediately at the surface, though much disseminated sulphide is seen in the quartzite.

From the relationships enumerated, future development is warranted in the quartzite along the contacts between schists and quartzite, near the contact between the flesh-colored, quartz-porphyry dikes and the quartzite, and especially near the points where schists quartzite and quartz-porphyry dikes converge.

Origin of the ore:—It is believed that the ore is a replacement of the quartzite. It is also thought that the ore had its source in the magma which was the parent of the quartz-porphyry dikes, and that when fissures for the reception of the dike material were opened, the ore in hot solutions accompanied the igneous rock and replaced the quartzite near the dikes, and also along the contact between the quartzite and other rocks where lines of weakness permitted ascension of the hot solutions. The quartzite is the only rock of the group capable of replacement to any extent, and that is why the ore is found restricted almost entirely to this rock.

The reasons for the opinions expressed above lie in the facts that the chalcopyrite is disseminated in the quartz-porphyry, apparently as a pyrogenetic mineral. The ore occurs in largest masses, so far as seen, in close proximity to these dikes, and where it occurs away from their immediate vicinity there is nothing opposed to the supposition that they are the source of the ore. A number of cases could be cited from the west, where deposits are well understood, which show copper deposits in replaceable rocks and associated with quartz-porphyry dikes, and in the case of quartzite, it would be replaced readily enough by very hot solutions. It is interesting to see how often quartz-porphyry, especially in the form of dikes, is associated with copper ores.

Petrography of the Rocks at the Mine

Along the north side of the quartzite between shafts 1 and 2 there is an interesting green schist in which there are numerous rounded, blue, opalescent quartz grains. In thin section the rock is seen to be made up of small interlocking quartz grains, a little pyrite, actinolite and these blue bodies of quartz. There appears to be a striking

[4]Bur. Min., Vol. XVI. (1907), p. 173.
[5]Bur. Min. Vol. XIII. (1904), p. 56.
[6]Ibid., Vol. V. (1895), p. 75.

difference between the number of mineral inclusions in the large blue grains and the small colorless grains. The inclusions look like iron oxide, and some of them may be recognized as hematite, but many of them are too small for identification. It is probable that the blue color is due to many of these inclusions being so small that they are in diameter less than one half a wave length of light and they are thus able to refract the light sufficiently to cause the color. As to the opalescent character it is thought that it must be due to some particular conditions of temperature under which the mineral cooled—perhaps to sudden cooling. In work in other regions these blue quartz grains have frequently been found in contact metamorphic zones, and in some places the relations to the contact have been so marked that one could often determine its proximity by these blue quartz grains. The rounded character of the mineral might be due to the fact that in rapid cooling to a crypto-crystalline condition the crystallizing force would not be so strong as in a phanerocrystalline variety of silica, and the mineral would take a rounded instead of a euhedral form.

In thin sections of the quartzite the features most marked are the interlocking of many of the grains, due to recrystallization, and the disseminated siderite and sulphides.

A thin section of diabase from the hill to the south of the deposit shows the feldspars much altered to zoisite and kaolin, and the pyroxene to uralite and chlorite. A great deal of quartz is present, but it may be secondary, having been derived partly from the alteration of the feldspars and partly by infiltration in solutions from without.

IRON AND LIGNITE IN THE MATTAGAMI BASIN

BY M. B. BAKER

In April 1910 I was instructed by the Deputy Minister of Mines to proceed with a party to the lower Mattagami river, and investigate the newly-discovered "coal" deposits reported as occuring there. After completing this work, I was to inspect an iron occurence farther down stream, which was then being developed by Mr. Foster Shields of Sudbury; and further, to examine the pre-Cambrian rocks between these areas and the Grand Trunk Pacific railway if time would permit. Accordingly I met my assistants in Cochrane on May 12th. My party consisted of Messrs W. D. Harding of Oshawa, McKay Meikle of Kingston, and Archie Mitchell of Toronto, who one and all entered with spirit and interest upon the work of the summer

The route from the Grand Trunk Pacific railway to the Iron and Lignite areas is necessarily by canoe, and as these routes are likely to be much used in the future, a detailed description of them may be useful to travellers, who are also referred to the map accompanying this report A glance at this will show that the area under discussion may be reached from three different starting points on the Grand Trunk Pacific, as three large rivers, the Mattagami, the Ground Hog, and the Kapuskasing, converge to form the lower Mattagami. These will be described in the order named.

Mattagami River

The Mattagami is about two hundred yards in width where crossed by the railway, and flows with a fast current for about two and a half miles to Smooth Rock Falls (Fig. 1). These are passed on the east shore by a portage of two hundred and fifty yards. For the next eight miles there is fast water, and a few small ripples, but nothing that cannot safely be traversed even in small canoes. At the end of this distance is Fish Rapids, which must be passed on the east side by a short portage of one hundred and fifty yards. The next ten miles are marked by strong currents, but no rapids to speak of. Poplar Rapids is reached, a long, crooked rapid at the mouth of Poplar Rapids river. These rapids, about one mile and a half in length, can be safely run even in ordinary canoes by keeping to the east shore. About half way down canoes cross to the west shore and follow the current. There is no portage, care only is necessary. For the next ten miles the water is quiet, as the river widens out for practically the whole of this distance, but at the end of this stretch is Cypress falls, which takes two plunges, in all about twenty feet (Fig. 2). At the foot of the upper and smaller fall is a deep circular basin, and large canoes may run this portion with safety by keeping close to the west bank. The portage at the north side of the basin should be taken, thereby saving nearly half a mile of the carry. Small canoes should be portaged from the head of the smaller fall on the west bank around the basin to the foot of the higher fall, making a portage of about half a mile all told.

From the foot of the Cypress falls, the river is faster again, but there is no difficulty even in small canoes. About three miles of fast water bring the traveller to the mouth of Ground Hog river, which enters from the southwest. As this river will probably be more used than the Mattagami, the route will be described from the railway to the junction with Mattagami river.

Ground Hog River

The Grand Trunk Pacific railway crosses the Ground Hog river about eighteen miles west of Mattagami crossing, and the river here presents a splendid appearance (Fig. 3). It is wide and deep, and with some islands within half a mile of the bridge the whole forms a pleasing view. This river affords a very much better route than the Mattagami. There are only four portages, and these are all short and very good ones. The remainder of the river is easily navigated in any canoe. From the railway for five and a half miles down the river there is a fair current, after which a small rapid is reached, easily run in



Fig. 1.—Smooth Rock Falls, Mattagami river.

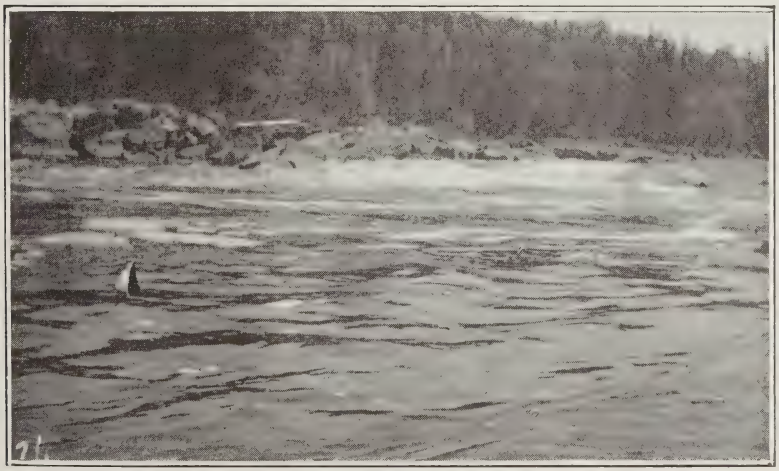


Fig. 2.—Cypress Falls, Mattagami river.

midstream. The next three miles is free of obstruction as far as Dixon rapids, which are very rough, but are overcome by a good portage on the east bank, about three hundred yards long. About one and a half miles of easy water follows, then a group of islands with fast water flowing about them, but by keeping to the east shore these are easily passed. Two and a half miles more of gentle current brings in view Hamilton rapids, which are passed by a two-hundred-yards portage on the east shore. Slightly over two miles farther is met the next break in navigation. Here there is a rapid with a chute at the foot of it. This is called La Duke falls, and is passed on the west shore by a portage of three hundred and fifty yards. For the next three miles the water is faster, but there is no difficulty whatever in travelling until Whist falls is reached. This fall is short, and is passed by a portage of a hundred and fifty yards on the west shore. From here to the junction with the Mattagami, a distance of about ten miles, the Ground Hog becomes gradually broader and shallower, so that in the summer months the water is very low and very fast. This makes travelling, in anything larger than a seventeen foot canoe, rather difficult, as the water is too shallow to float a loaded canoe. There are no more rapids nor portages, however, and except in the low water of August, this is a much preferable route to the Mattagami. Having now reached the Mattagami, its description will be continued to the entrance to the Kapuskasing river.

The Mattagami flows with a strong current from the mouth of the Ground Hog for four and a half miles. Then a rough rapid is reached around an island, which, in low water, becomes a point. This is called Shore rapids, and the portage is on the island, about one hundred and fifty yards in length. In low water the rapid can be safely run on the east side of the island. A little less than two miles from this island is the entrance of the Kapuskasing, with no further breaks in navigation between.

Kapuskasing River

The Kapuskasing affords the best and easiest route, especially in the summer months, for both the others get so low that they are too shallow in many places for even the smaller canoes. The railway crosses the Kapuskasing at White Spruce falls (Fig. 4), as they are called in the older reports of the Bureau of Mines. An island about the middle of the river forms an excellent opportunity for bridging, and this has been taken advantage of by the builders of the railway. About a mile below the bridge is a small rapid which can be run in larger canoes, but a short lift over a point on the east shore is the safer method for small canoes. Three-quarters of a mile farther down stream is another small rapid, with a portage of fifty yards on the west shore, but this can also be run safely in larger canoes. About three-quarters of a mile below this is a rough fall, called Sturgeon falls (Fig. 5), because it is alleged that the sturgeon never go above this point (see Fig. 6). A short portage across a point into a cove on the east shore must be used here. This is the last portage that need be made on the river, although there are four other rapids that require some care in running. The first of these is about twelve miles below Sturgeon falls, where the river narrows and flows through a narrow channel, but this is in reality only very fast water which can easily be run in a small canoe. Two miles of easy current brings one to the mouth of Lost river, which enters from the west, and is navigable to the railway by a very circuitous route of some thirty miles. Immediately below the entrance of Lost river is the second rapid, but this can also be run on the west side. There is no further trouble for sixteen miles, where occurs another rapid, which is rather rough. It can be run in larger canoes, and lined down in smaller canoes, or a short lift over a point on the east shore may be used. It is about seven miles from here to the mouth of the river, where there is a long rough rapid, which can be run even in small canoes by keeping close to the east shore. The foot of this rapid effects a junction with a broad stretch of the Mattagami river, which will now be followed to the point where it empties into the Moose river.



Fig. 3.—Ground Hog river at G.T.P. railway crossing.



Fig. 4.—White Spruce falls, Kapuskasing river.

The Lower Mattagami River

Below the entrance of the Kapuskasing there is splendid travelling for about nine miles to Devil's rapid, a very rough piece of water (Fig. 7), with a chute at the foot (Fig. 8). There is a double portage on the east shore. The first starts at the head of the rapid, and is the safer one to take, but a second portage starts at a small eddy below the first short stretch of rapids, and joins the longer portage about one-third of the way across. This reduces the portage to about a third of a mile, whereas the whole portage would be about half a mile. The lower end of this portage leads to a broad lake-like expanse of the river. A sandy island has been formed at the foot of the rapids. Canoes pass on the inside channel east of this island, and have fast but safe water for about eight miles, as far as a group of islands at the head of a long, rough rapid, with a chute near the foot. This rapid is the first of a series that in the next ten miles drop a total of four hundred and twenty-five feet, indicating the roughest part of the river (Fig. 9). The Little Long portage by which this first rapid is passed is on the west shore and is difficult to find. Keeping to the west shore, two islands are passed to the



Fig. 5.—Sturgeon Falls, Kapuskasing river.

very head of the rapids, where there is a blind channel into the west bank. This is followed for a hundred yards where it turns sharply to the north. At the northern end of this arm is the portage, one and a half miles in length, but a very good one. The other end of the portage comes out at a sharp notch in the rocks. The water here is very fast, but is safe with ordinary care. On leaving the portage two islands are passed by the western channel, then the river is crossed to the east channel, between a large island and the main shore, where there is the head of a short but stiff rapid. A short lift over the point just above the draw is the safest method for passing this. Another mile of fast water is succeeded by Wagadawing rapids, which is in reality two rapids; the upper and shorter one of which may be run close to the west bank to an eddy, from which a second portage joins the longer one from the head of the rapids. This portage is half a mile long, while that from the lower eddy is not more than three hundred and fifty yards.

About half a mile below Wagadawing rapids is a short, rough rapid, which can be lined down, on the west bank in high water, or passed by a lift over the point of rock in low water. This rapid is rough and not safe for any but large canoes. Another half mile brings us to Smoky falls, so named because the spray of the falls hangs continually as a cloud over the canyon. This is one of the most beautiful gorges and falls of the north country (Fig. 10); the water divides around an island at the very head of the

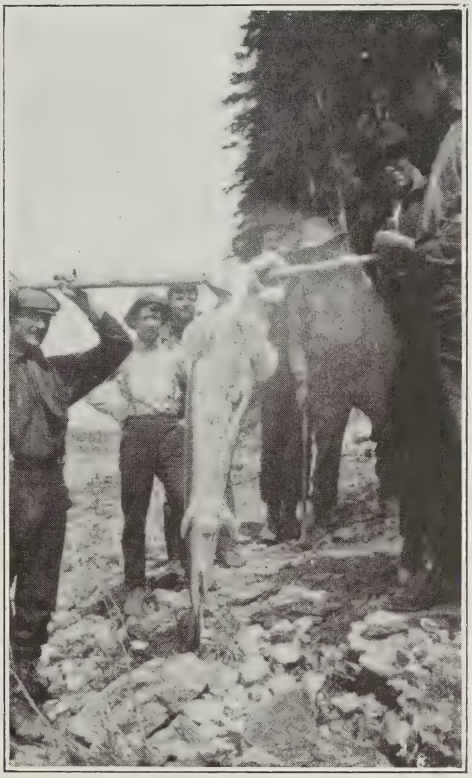


Fig. 6.—Sturgeon taken in Kapuskasing river.



Fig. 7.—Devil's rapid, upper stretch, Lower Mattagami river.

falls, and drops vertically for twenty-five feet, then boils through a narrow canyon, forming a most beautiful picture (see Fig. 11).

A portage of about five-eighths of a mile is on the west shore, just oppsite the head of the island.

We now cross the river to the east shore, and about half a mile below Smoky falls come to a rapid at a sharp point. This can be lined down, or a short lift across the point to a cove saves time and possibly danger. Half a mile farther there is another rough rapid, with a portage of three hundred yards across the point on the east shore. The east bank is then followed around a bay-like enlargement of the river, for about half a mile, and at the very head of the rough rapids (Fig. 12), and at the foot of a high clay bank, comes the Long portage, four and a half miles. The portage leads up this clay bank to the top, about seventy feet, then strikes off to the north, and after a mile of excellent going a small lake is reached, which may be used or not, as the traveller wishes. The next two and a half miles are over a sandy plateau, and the portage is in excellent shape, but the last mile is not so good, there being more muskeg and marshy land to cover. At the north end of the portage, another steep clay hill is descended to the river. This is the last portage, and one may travel from here to Moose Factory on James bay without leaving the canoes. Much fast water will be encountered, but it is nowhere dangerous, except possibly Grand rapids, some twenty-five miles below the Long portage.

Seven miles below Long portage is the Big Bend of the Mattagami river. Just above this bend the newly discovered lignite is located, which was primarily the object of this expedition. The deposits are described later in this report. About eighteen miles down stream from the lignite is the head of Grand rapids, a long fast rapid which extends for two miles. It can be safely run on either side, but the east shore is preferable. The rapid is over a shelving series of limestone beds (see Fig. 13), so it is not rough, but is a series of small steps. This is the only place that demands care in passing. The remainder of the Mattagami to its junction with the Moose river is shallow, broad, and very fast (Fig. 14), but is perfectly safe. The same may be said of this latter river to the Hudson bay post on James bay. Grand rapids is an important point on the Mattagami, for here are found the iron ores, which it was also my duty to examine, and which are described later in this report.

Geology

Ever since the emergence of the Laurentian plateau from the Archean sea, a height of land appears to have been maintained between the Great Lakes and the basin of Hudson Bay. Within this basin a series of later sediments, including Paleozoic and Pleistocene accumulations, has been deposited. A similar but more extended series has been laid on the Great Lakes flank of this old barrier. The Hudson Bay basin therefore presents a well-marked geographical, as well as geological basin, bounded by a distinct rim of pre-Cambrian crystalline and metamorphic rocks. This latter area presents a somewhat rough undulting surface, dotted by many small lakes, marshes, swamps and muskegs, and has a steep grade towards James Bay from all sides, as is clearly shown by the convergence of the many splendid rivers which flow down its slopes. The rapid descent is most pronounced where the pre-Cambrian approaches the margin of the Paleozoic sedimentary area. As a consequence, the "long portages" on all these rivers occur at these points. Once the sedimentary area is reached the flow is very rapid but gradual all the way to Hudson bay, so that no portages are necessary for practically the whole journey.

Laurentian Plateau

The Laurentian plateau in northern Ontario is commonly styled a rocky country, but several seasons of field work in that part of the province have led to the conviction that the amount of rock exposed is very much less than is commonly supposed. In fact, except at rapids or falls, where rivers have cut rather deep gorges in the drift, there is scarcely an outcrop of rock to be seen in the country, so that it is essentially



Fig. 8.—Foot of Devil's rapid, Lower Mattagami river.



Fig. 9.—Rough water on Lower Mattagami river.



Fig. 10.—Smoky falls, Lower Mattagami river.

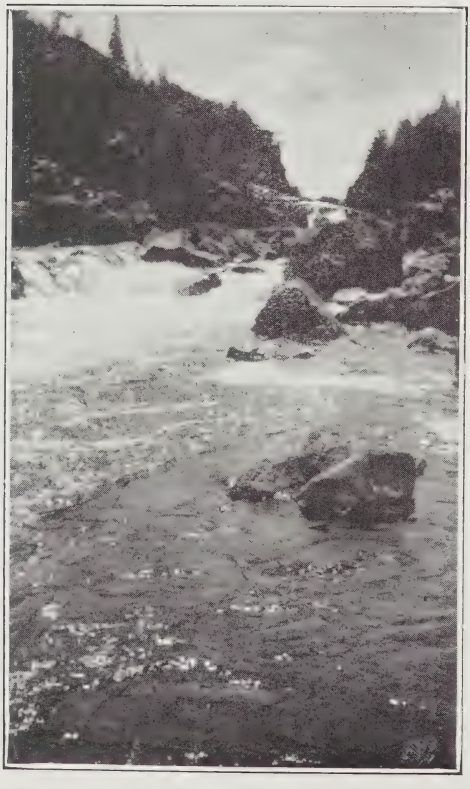


Fig. 11.—Foot of Smoky falls, Lower Mattagami river.

an agricultural one. The Paleozoic area has a flatness that is monotonous, and is perhaps too wet and flat to admit of sufficient drainage for agricultural purposes. Moreover the upper portion of this area is sand and is quite unsuited for agriculture. The suitability of the coastal plain for farming will be discussed in greater detail when dealing with the Recent deposits.

This report is primarily intended to discuss the lignite and iron deposits, but in order to do this, it is desirable to describe briefly the stratigraphy of the area, since this will aid much in accounting for the economic occurrences of the district.

Stratigraphical Record

Recent	
	(*Erosion unconformity*)
Pleistocene	Glacial Inter-glacial, lignite series Glacial
	(*Erosion unconformity*)
Paleozoic	
	Corniferous
	(*Erosion unconformity*)
Upper Huronian	
	(*Erosion unconformity*)
Post-Middle Huronian	
	Diabase.
	(*Intrusive contact*)
Laurentian	

The Laurentian Rocks

The reader is reminded that the area under examination lies north of the Grand Trunk Pacific railway, and here no Keewatin rocks were seen. They do come in, however, a short distance directly south of the railway. The oldest formation seen in this area therefore is the Laurentian. It consists almost entirely of typical pink granite gneiss, but varies in many places to a hornblende granite, or to a mica granite. The rock for the most part is coarse grained, and consists chiefly of three minerals, quartz, orthoclase, and biotite mica, with various accessory minerals, the chief of which is microcline. All the feldspar is more or less decomposed, so that the weathered surface of the rock has a distinct kaolinic appearance. Practically the whole of the pre-Cambrian area north of the railway is this pink gneiss, of very uniform character throughout.

Cutting this in all directions is a series of diabase dikes, many of which are indicated on the map which accompanies this report. These dikes are the typical post-Middle Huronian diabase of the north country, and do not seem to differ in any way from the diabases of other portions of northern Ontario. They vary in width from mere stringers up to 250 feet; examples of the latter occur at the foot of The Long Portage (Fig. 15), and again in the channel of Wagadawing rapids. They are dark gray, medium to fine grained diabase, composed of laths of fresh labradorite feldspar, set in a ground mass of augite, which is partly in felt-like aggregates resembling uralite, and partly in larger well defined crystals and grains. A little original quartz is to be seen in thin sections, and often in the hand specimens, together with accessory pyrite and magnetite. At several places, calcite veins were found up to three inches in width cutting this diabase, but they did not show any of the silver, nickel or cobalt minerals so characteristic of similar occurrences in the Gowganda or Elk Lake areas.



Fig. 12.—Rough stretch of Lower Mattagami river, below Smoky falls.



Fig. 13.—Grand rapids, Mattagami river.

Upper Huronian

As a fringe along the edge of the sedimentary basin is a formation which has been placed as Upper Huronian or Animikie in age. There are but few outcrops, and these only along the border. It is made up of a rich, dense brown siderite, which shows a banded structure in places. The composition is very pure, as is shown by the following analysis:

——	Fe	CaO	MgO	CO_2	Al_2O_3	MnO	Sp.G.
Siderite from Grand Rapids Mattagami River	43.27	1.47	0.91	34.94	2.31	1.74	3.63



Fig. 14.—Mattagami river, above its junction with the Moose.

Associated with this siderite is a fine grained quartz conglomerate, shading in places to quartzite. The pebbles of this conglomerate are for the most part quartz, which apparently have been derived from the Laurentian, and cemented by a siderite. This Animikie siderite is an important formation, for it is probably the source of the limonite to be described later.

J. M. Bell found a similar siderite on the Opazatika river in 1904, for he says:[1] "Apparently the carbonates have resulted from the direct precipitation from a sea-water rich in iron, magnesia and lime, on the surface of the upturned gneissic beds cut by dikes of pegmatite. . . . No fossils are found within the beds and their age is in consequence a matter of conjecture, but from their lithological resemblance to the iron-bearing calcareous magnesium rocks of the Mesabi Range on Lake Superior, they have tentatively been classed as Huronian." But he immediately adds, "though, as a matter of fact, they may be more correctly correlated with the ferruginous carbonates of the Devonian of the coastal plain."

At the head of Grand Rapids, siderite, sideritic-conglomerate, and quartzite were found all in situ, and by digging out one outcrop a photograph was obtained (see Fig. 16). By wading into the water at the head of the rapids the siderite and conglomerate

[1]Bur. Min., Vol. XIII. (1904), p. 152.

could be quite easily traced across the bed of the river. Chemical analyses of this rock together with that of the Helen mine siderite, and of a typical piece of Animikie siderite from the Mesabi Range are given below for comparison.

Locality.	Fe	CaO	MgO	CO_2	Al_2O_3	MnO	SiO_2	Sp.G.
Siderite from Grand Rapids	43.27	1.47	0.91	34.94	2.31	1.74	1.40	3.63
Typical Animikie siderite, Loc. 5, Township McGregor	28.97	3.59	6.20	29.06	5.41	3.50	22.87	3.40
Siderite from Helen Mine	35.69	1.03	7.53	37.18	3.92	.....	.....	3.72



Fig. 15.—Diabase dikes, foot of the Long Portage.

That these siderites are silicious sediments of pre-Cambrian age seems clear from the following features: The lack of fossils and of bedding, their compact structure, their occurrence as a fringe along the edge of the Paleozoic and next to the Laurentian floor, their lithological and chemical character, and the massive texture which seems to correlate them with the Animikie iron formation of the Lake Superior basin,—a corresponding basin on the south side of the same Archean axis.

Whether they are Animikie or not, however, does not really signify. There is no doubt that they are pre-Cambrian, and the significant fact is that on the north side of the old Archean axis Proterozoic sediments are laid down, just as they are on the southern side. If they ever covered the axis itself, they have been removed by erosion, but this is doubtful, as some few outliers would surely have been left. Since rocks of a similar character are reported by Dr. Lowe,[2] and by Dr. C. K. Leith,[3] it seems fair to presume that there is a considerable area of these sediments in this basin, and if so it is also reasonable that with better opportunities for exploration, economic deposits similar in kind, if not in extent, to those in the Lake Superior basin, may be hopefully looked for in the future.

Paleozoic

Lying unconformably on the pre-Cambrian is the Silurian and Devonian limestone in practically horizontal, undisturbed condition, although in a few places subsequent folding has produced local anticlines and synclines. The general dip of the series is to

[2]Geo. Sur., Can., Vol. XIII., 1903. [3]Economic Geology, Vol. V., p. 227.

the southeast. The exposures are in cliffs of earthy, drab to dark, bituminous limestone. The cliffs are much dissected by enlarged joint-planes through dissolution (see Fig. 37), and rise twenty to thirty-five feet abruptly from the water. Fossils are quite abundant in these rocks, a number of which were collected and brought back. These have been identified by Dr. C. R. Stauffer, Paleontologist at the School of Mining, Kingston, who reports as follows:

The collection of fossils brought back from Mattagami river by Professor M. B. Baker, proves the presence of both the Devonian and Silurian limestone in that locality. In addition to many of the Devonian forms reported by Professor W. A. Parks[4] from the Kwataboahegan river, such as:

Favosites gibsoni, Parks.
Phillipsastrea verneuli, E. and H.
Zaphrentis gigantea, Lesueur.
Atrypa reticularis, Linnæus.
Meristella nasuta, Conrad.
Spirifer divaricatus, Hall
Conocardium cuneus, Conrad.
Loxonema robusta, Hall.
Dalmanites (Chasmops) anchiops, Green.
Etc., etc.



Fig. 16.—Animikie siderite.

the collection also contains specimens of the following Devonian forms:

Favosites emmonsi, Rominger.
Favosites polymorphus, Goldfus.
Henderella canadensis, Nicholson.
Atrypa impressa, Hall.
Stropheodonta hemispherica, Hall.
Modiomorpha mytiliodes, Conrad.
Pleurotomaria lucina, Hall.
Gyroceras trivolva, Conrad.
Orthoceras zeus, Hall.
Aspidichthys notabilis, Whiteaves.
Etc.

Except Favosites gibsoni, Atrypa impressa, and Aspidichthys notabilis, it will be noted that these are all typical Onondaga (Corniferous) limestone forms, such as are found in many of the outcrops of southwestern Ontario as well as in the adjoining regions of the United States.

[4]Bur. Min., Vol. XIII. (1904), Pt. I., pp. 180-191; plates I.-VIII.

Favosites gibsoni is an abundant coral. One specimen shows in addition to the characters given to the species in the original description, a decided tendency to branch, three or four small knob-like projections extend out from one side and the broken end has the base of a projection which is most likely a true branch. A close examination of the weathered surface shows a remarkable arrangement of the corallites. About one in twelve to fifteen is slightly larger than the others, and the ordinary-sized individuals are arranged in circles of six to nine around the larger ones, while the inter-spaces thus left are also filled with smaller ones. This latter feature is scarcely observable on the unweathered surface, and every other feature tallies so well with the species to which this particular specimen has been referred, that it can hardly be considered a distinct species.

Atrypa impressa is a form which has been reported from the basal portion of the Middle Devonian of New York and Michigan only. Hall considered it a typical Scholarie grit form. The specimens in this collection are well preserved and the pedicle valve shows no sinus, while the brachial valve has the mesial elevation marking the front or upper half of the length, is flattened, evenly furrowed on top, and the front is cut off squarely. It is undoubtedly the species described in the New York reports.

Aspidichthys notabilis? The fish plate, doubtfully referred to this form, is very fragmentary, but has the thickness which Hall referred to in describing A. clavatus,



Fig. 17.—Irregular folds in lignite series.

and the characteristic coarse tuberculation. Robert Bell[5] brought back from the James Bay region a number of fragmentary plates which Whiteaves referred to Macropetalichthys rapheidolabis. The interesting point in regard to the plate here under discussion is that it represents an entirely different form, and thus proves the existence of another one of the great Devonian fishes in that northern Paleozoic sea.

Every collection of fossils brought back from the James Bay region increases the list of common Middle Devonian species occurring there. The Corals, Cephalopods and Fishes are believed to be European immigrants into the great interior sea (Eastern Continental Sea of Williams) of North American Devonian time.[6] The importance of these elements in this northern Ontario region not only piles up evidence in favor of the supposition that those formations were once an integral part of the great, Middle Devonian deposits to the south, but suggests the route by which these forms reached the inner portion of that ancient Mediterranean sea. Only one Silurian fossil, Calymene niagarensis, was brought back in this collection. It was collected in a loose block from the bed of the Mattagami river and probably proves the occurrence of the Niagara limestone somewhere in that neighborhood.

Pleistocene

At the close of the Corniferous the sea must have retreated to the northeast, for there is no further sedimentation on this area until Pleistocene times, which show

[5]Geo. Sur., Can., Rep. Prog., 1875-76 (1877), pp. 319, 320.
[6]H. S. Williams, Am. Jour. Sci., 3rd series, Vol. XXXV., 1888, pp. 51 59.



Fig. 18.—Boulders of lignite in drift.



Fig. 19.—Typical Saugeen clay.

at least two glacial epochs, with a very long inter-glacial period during which the lignite series was formed. The lower drift is made up of clay, sand, and boulders of all sizes, for the most part of limestone rock which shows the typical glacial character; the whole being a typical glacial drift.

This is followed by an inter-glacial lignite series, composed of a lead-blue clay, arenaceous shale, lignitic clay and lignite itself. The entire area is not of even thickness, but is apparently from twenty to fifty feet. The inter-glacial beds suffered tremendous erosion from the ice of a later glacial age, which served to crumple, gouge, and plough up the lignite series in many places into irregular folds (see Fig. 17). This later glacier deposited a thick layer of dense boulder-clay containing many rounded and scoured pieces of lignite, which is a proof that glaciation not only followed the deposition of the lignite series, but that it was sufficiently later to allow for the formation of the lignite itself (Fig. 18).

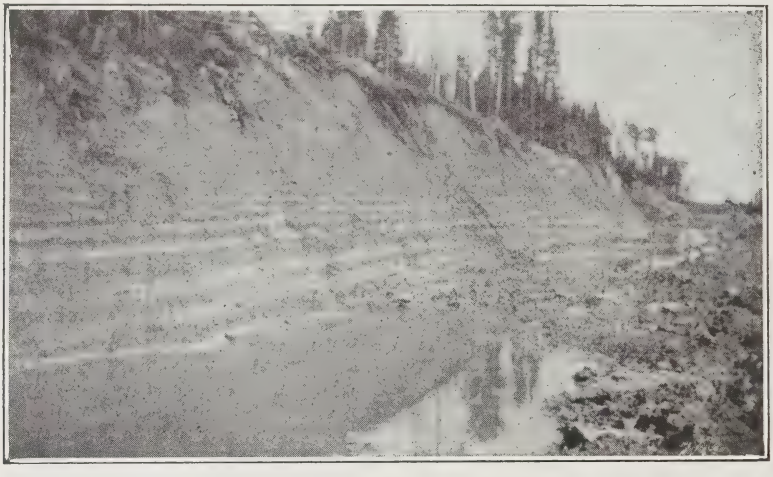


Fig. 20.—Bank of Saugeen clay.

The Upper Clays

The uppermost portion of this last glacial drift passes into typical Saugeen clay (Fig. 19), of which the popularly called Clay Belt of northern Ontario is largely made up. The Saugeen clay forms great banks in most of northern Ontario (see Fig. 20). It is composed of alternating layers of very fat clay, with layers of find sand or silt, the interlamination being very pronounced (see Fig. 21), and so characteristic of Saugeen clay that the latter is readily identified anywhere. The Saugeen clay forms the uppermost portion of the last Glacial series, and the writer has suggested[1] that it owes its origin to depositions about the ice margin during the retreat of the sheet. During the summer or warmer season the increased flow of water from the ice-front would carry the clay farther out and drop the sand nearer to the edge. Then during the winter or colder season the decreased flow of water would drop clay on top of the last layer of sand. This process would be repeated year after year, and the accumulation would be carried gradually farther and farther north. Every two layers would represent the accumulation for one year, thus forming a possible means of estimating roughly the duration of this stage of the ice retreat.

The layers of clay and sand are usually about half an inch in thickness, but they occasionally ran up to three inches (see Fig. 20), when the thick layers are at the bottom and the thinner ones occur as we ascend the bank. The total thickness of Saugeen clay would be difficult to estimate. The deepest cutting seen was on the

[1]Bur. Min., Vol. XV. (1906), Part II.

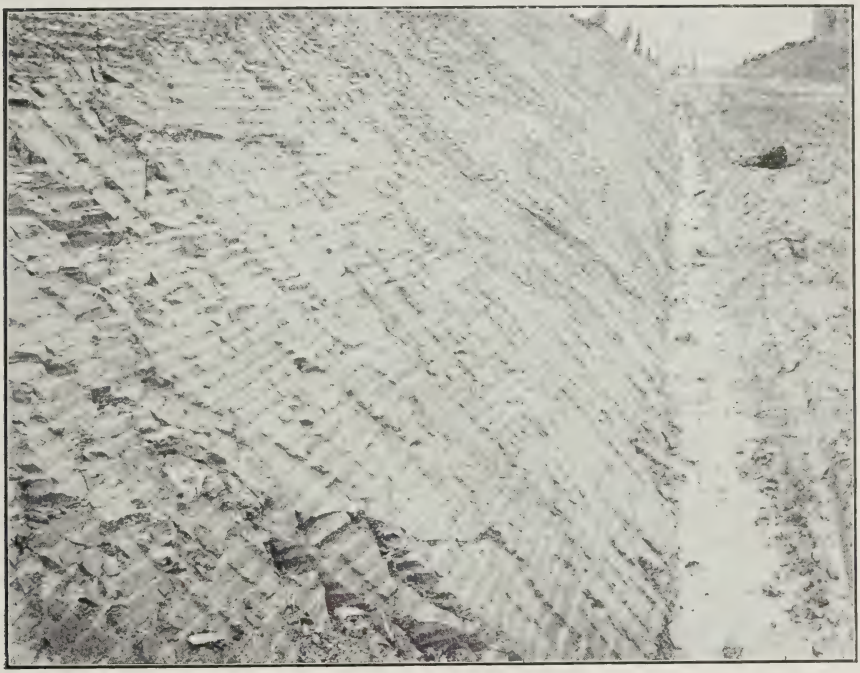


Fig. 21.—Saugeen clay along railway near the shore of Lake Temiskaming, between Haileybury and New Liskeard.



Fig. 22.—Saugeen clay, showing boulders.

railway just east of the Ground Hog river, where a Saugeen bank twenty-six feet deep occurs. There are occasional glacial boulders found in this clay (see Fig. 22), and these are attributed to droppings from floating ice.

When the Saugeen clay is exposed to the weather the clay layers soon "slake" down and mix with the sand to form excellent clay loam, and thus constituting an excellent soil for agricultural purposes. It can therefore be seen why the Clay Belt is forming such an attractive area for settlement now that transportation is established through the Grand Trunk Pacific railway and the Temiskaming and Northern Ontario railway.

Recent Deposits

At the close of this last glacial retreat the sea must have advanced once more over the Moose Basin to approximately the pre-Cambrian boundary line, for there is found everywhere as the uppermost layer of loose material, sand and silt varying from two feet near the rim of the basin, to fifteen feet near Moose Factory. These are stratified marine sands, as shown by the presence of shells of many representives still living in James and Hudson Bay. A considerable number of these were collected and have been identified by Dr. Stauffer as follows:

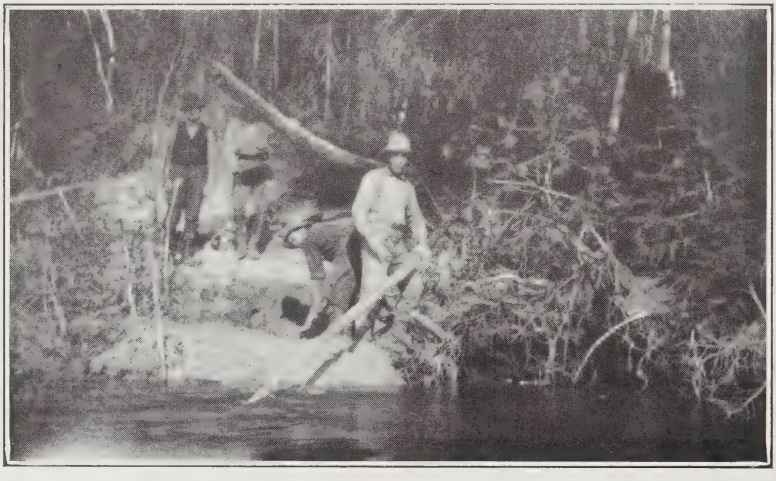


Fig. 23.—Testing lignite deposit with auger.

Marine Forms.

Pelecypods:

Cardium islandicum, Linnæus.
Macoma fusus, Say.
Macomus proxima, Gray.
Mya arenaria, Linnæus.
Mya truncata, Linnæus.
Saxicava artica, Linnæus.
Saxicava rugosa, Linnæus.

Gastropoda:

Fusus ventricosus, Gray.

Land and Fresh Water Forms.

Gastropoda:

Amnicola porata, Say.
Helix striatella, Anthony.
Limnæus elodes, Say.
Limnæus pallida, Adams.
Limnæus umbilicata, Adams.
Physa ancillaria, Say.
Plamorbis bicarinata, Say.
Succinea obliqua, Say.
Volvata tricarinata, Say.

These forms have also been reported in part from the post-Pleistocene deposits of the Ottawa valley, in part from the St. Lawrence valley, and from the deposits surrounding Lake Champlain, and they all belong to living species. The uppermost layer of sand which covers the Paleozoic sedimentary area renders this part of the basin unfit for agriculture. It forms a great flat plain which is almost entirely muskeg covered, and with the exception of the sphagnum moss supports little other growth. It is like a great prairie of moss and peat, with only a few scattered scrubby spruce trees upon it. In this connection may be summarized Mr. E. B. Borron's observations made after his examination of this area in 1890:[8]

In the flat country south of James bay underlaid by the Devonian limestone there are three classes of agricultural or pastoral land. (1) The strip immediately adjacent to the waters of James Bay, from a quarter of a mile to four miles in width, on which there is naturally fine pasture, and much marsh hay. A large number of cattle could be supported on this strip. (2) The low lying bottoms, points, and islands of alluvial soil found at intervals on the rivers in the territory. This land is good, but generally flooded in the spring, and while of considerable extent in the aggregate rarely occurs in blocks of sufficient size to form a large settlement. (3) A narrow strip along the margin of rivers varying from a quarter to a half mile back from the river. The whole country from the Abitibi on the east to the Albany on the west, and extending many miles inland to James Bay, is a vast level clay plain, overlaid almost everywhere by peat-bogs of very extraordinary extent.

The peat mosses described by Mr. Borron are estimated by him to occupy ten thousand square miles. While undoubtedly detracting from the agricultural capabilities of this district very materially, these great peat beds have a value of their own. It is not improbable that in the absence of a good quality of coal, prepared and pressed peat-fuel may come largely into use in Ontario, and if means of transportation are afforded, an inexhaustible source of supply would be opened up in this northern territory. Recent improvements of manufacture give ground for hope that we may soon be put in possession of a really efficient and economic fuel produced from peat. The value of peat as a deodorizer is also coming to be recognized, and in disposing of sewage and waste-matter it finds much employment in the cities and towns of continental Europe. In the form of moss-litter it is used with great success as bedding for stock, owing to its capacity, when dry, of absorbing as much as twenty-five times its own weight of moisture. When its use in stables is ended it is in condition to be employed as a fertilizer of the highest value. Peat also provides raw material for textile fabrics, and is employed as a preservative packing for fruit and perishable articles.[9]

It is estimated that the edge of this basin at the long portage on the Mattagami river is now three hundred feet above James Bay, so that there has been a recession of the sea to that extent since these most recent deposits were laid down, and the recession is still in progress.

[8]Rep. on the Basin of Moose River, p. 16.
[9]For a fuller account of peat deposits in Ontario and elsewhere, and their utilization for fuel or other purposes see Bulletin No. 1, Department of Mines, G.S.C.; also Peat Fuel; Its Manufacture and Use, Bur. Min., Vol. XII., 1903.

Lignite

Lignite has long been known to exist in the Moose River basin of northern Ontario, having been reported on almost every river of the James Bay water-shed. The economic possibilities of most of this lignite were investigated and reported upon for the Bureau of Mines in 1904, by J. M. Bell.[10] New and rather extravagant reports, however, were circulated during the winter of 1909-1910 to the effect that real "coal" had been discovered in the vicinity of the Grand Trunk Pacific railway on the Mattagami river. Several square miles of claims were staked out and recorded. The investigation of these reports was one of the primary objects of this expedition. A very brief examination served to convince the writer that the deposit had few economic possibilities. A short interim report to that effect was sent to Mr. Gibson, the Deputy Minister of Mines, and no further staking of coal took place during the summer of 1910.

Lignite or brown coal may be described as a fuel about half way in the state of carbonization between peat on the one hand and bituminous coal on the other. The term is a loose one, and includes materials of wide divergence in chemical composi-

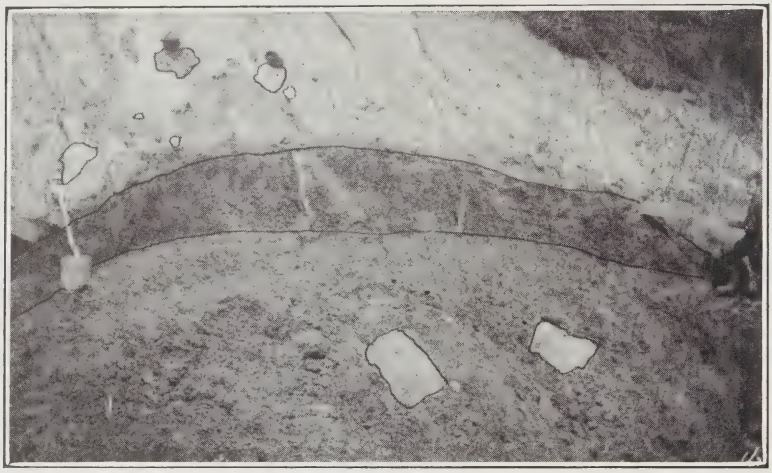


Fig. 24.—Lignite fold cut off by glaciation.

tion, in texture, and even in mode of occurrence. The "braun kohl" of Saxony is so soft that it is dug from the field with spades, and piled in great stacks to dry, when it forms a valuable fuel. On the other hand, the lignites of the Western States and those of Western Canada are black, comparatively highly carbonized, firm, even with conchoidal fracture, and require to be broken with a pick. The lignites of the Moose region are, considering their recent age, in a remarkably advanced state of carbonization. (See the analyses given below.) Some of them compare favorably with the lignites of Souris and Lethbridge, others are typically brown, resembling the German variety. As already mentioned, the lignites of northern Ontario are of interglacial age, occurring in stratified beds of clays, sands, etc. These coal measures occur extensively throughout the whole Moose Basin, but they do not always carry lignite, although in general they are more or less carbonaceous.

The lignite of the Mattagami river outcrops at the east bank about one mile upstream from Big Bend, or about eighty miles down stream from the railway. The location is shown on the map accompanying this report. The outcrop cannot be seen except in the lowest water. It then shows in two narrow seams dipping into the east bank at an angle of about 50°,and striking W. 30° S. The upper seam is six

[10]Economic Resources of Moose River Basin, Bur. Min., Vol. XIII. (1904).



Fig. 25.—Tree trunks and limbs buried in lignite.



Fig. 26.—Iron ore exposure, Mattagami river.

feet thick at the thickest place; lying below this are four feet of clay quite dark and lignitic in places, followed by one foot of lignite, below which is a fat, lead-blue clay, which was bored into for sixteen feet without showing further lignite.

The method of examination was by boring, carried on by means of an-inch-and-a-half auger, welded into gas-pipes, which we carried in five-foot lengths. These could be screwed together, giving a total length of twenty-two feet. By drawing the core every three to five inches, the exact nature of all material passed through could be readily determined (Fig. 23). One pit, five feet square, was also dug for ten feet to show the nature of the deposits, and subsequent borings were readily compared with the layers of material passed through in the digging.

These lignites do not occur in beds associated with consolidated rocks, but in beds both overlaid, and underlaid by clay and sand of inter-glacial age. That this is the occurrence is clearly shown by beds of boulder clay, carrying striated pebbles, which underlie and others which overlie the lignite series, while the lignite series itself is made up of beds of clay of a deep lead-blue color, also bands of grayish white sand, beds of lignitic clay, and lignite itself. All this series is absolutely free from boulders or other glacial material.



Fig. 27.—Limonite showing botryoidal form.

The lignite is in beds of quite irregular thickness; in places these are warped, shoved, ploughed, and crushed out of shape. The folds are often cut off by glaciation (see Fig.. 24), at other times the beds are cut out entirely by glacial erosion. These same characteristics are mentioned by Mr. Bell in his report on the lignites of other parts of this area.[11] In the glacial drift immediately overlying, or to the south of the best exposures of lignite near the Big Bend on the Mattagami river, are found rounded, scoured boulders of lignite, like other boulders in the drift (see Fig. 18), clearly showing that the later advance of the ice scoured off portions of this inter-glacial lignite series.

Most of the lignite is laminated, showing stems, twigs, leaves and reed-like characters, but buried in this looser material are many sections of the limbs and trunks of trees (see Fig. 25). By digging up some of the lignite a few of the larger of these trees were secured, the largest one measuring seventeen inches in diameter. This would represent a rather substantial tree before compression. Scattered abundantly through the loose lignite are fragments of perfect charcoal, which have

[11]Bur. Min., Vol. XIII. (1904), p. 161.

been preserved as fragments of charred wood, as if a fire, probably started by lightning, had passed over this portion of the area, leaving pieces of charred wood which are now scattered through the lignite at this point. Many of these pieces have all the appearance of charred cedar, with its typical silky, slivery or flaky character, with which anyone who has seen it is familiar.

Analyses of Lignite

Locality.	Fixed carbon.	Vol. combustibles	H_2O	Ash.	Remarks.
Lethbridge, Alberta	54.93	26.87	12.08	6.12	High grade, firm cannel-like.
Golden City, Colorado	45.57	37.15	13.43	3.85	Buried 50 ft. below surface.
Moose River, Ontario	44.03	41.39	11.74	2.84	Collected by Dr. Robert Bell.
Souris River, Manitoba	40.72	38.58	16.92	3.78	Firm, conchoidal fracture, buried 100 ft.
Big Bend, Mattagami River	40.31	39.24	11.45	9.00	Woody lignite, light yellow ash.
Big Bend, Mattagami River	40.53	46.44	11.22	1.81	Frag. of tree, jet like, conchoidal fracture.
Blacksmith Rapid, Abitibi River	36.58	39.66	16.46	7.28	Mossy lignite.
Big Bend, Mattagami River	26.25	40.43	12.27	21.05	Mossy, loose, reedy ; reddish ash.



Fig. 28—Iron ore deposit, Mattagami river.

From the analyses above it is surprising to note how well carbonized is this lignite, considering its recent age, but it is evident that the interglacial period itself in which this lignite was formed was of long duration. Not only was there deposited a considerable thickness of stratified clays and sand, but there was sufficient time for a great peaty or swampy growth, as well as for trees of large size to mature, be buried and thoroughly carbonized before the next glaciation, for the fragments of lignite found in the drift, as mentioned above, are evidence that the lignite had formed before the later glaciation, and that its carbonization was then quite complete.

From the amount of carbonization that the lignite in general has undergone, as shown by the analyses, it can be seen that this lignite is of rather low grade, but is sufficiently carbonized to produce a good fuel if briquetted. The difficulty with these lignites of northern Ontario is their irregular thickness, and lack of continuity. They are of wide distribution, but in scattered patches, and of variable thicknesses. Moreover, they are buried beneath loose accumulations of sand, clay and drift, which probably could not be economically removed, or supported by timbering or otherwise, as the roof would not be solid rock but loose material, and, therefore, neither self-sustaining nor capable of being held in place by pillars of coal, or by timbering within a reasonable cost. This lignite has a decided tendency to slake or disintegrate upon exposure to the air. Even the solid, jet-like fragments of trees very soon crumble to small pieces,

so that even were the deposits thicker and more easily mined, the lignite would require briquetting before it would be of much importance commercially. Beyond local use, confined to the outcrops from which a few tons might be economically mined, it does not seem that the lignite of the Moose Basin has an economic value.

Iron

The iron ores on the Mattagami river were discovered by Dr. Robert Bell and described by him[12] as follows:

This locality is remarkable for the occurrence of a large deposit of iron ore. Its position is on the northwest side of the river, at the foot of the rapids. It runs along the foot of the cliff for a distance of upwards of three hundred yards, almost continuously, with an exposed breadth of twenty to twenty-five yards. The highest points rise about fifteen feet above the level of the river. The surface is mottled, reddish-yellow and brown, and has a rough spongy or "lumpy" appearance, like that of a great mass of bog-ore. At the surface and sometimes to a depth of several inches it is a compact brown hematite, occasionally in botryoidal crusts, with radiating columnar structure; but deeper down it is a dark-grey compact, very finely crystalline spathic ore, apparently of a pure quality. The brown hematite evidently results from the conversion of the carbonate.

The deposit was also examined and reported on in more detail by J. M. Bell.[13] Both these geologists appear to have seen only the deposits at the foot of the rapids, whereas deposits of equal size and possibly of equal richness occur at the head of the rapids, one mile and a half farther up stream. These deposits occur on both banks of the river. They extend across the bed of the river at both places, and they stretch along the shore for about eleven hundred feet in each case. They reach in places fifteen to eighteen feet above the level of the river, but their full thickness cannot be estimated, as they extend below water level in almost every case (Fig. 26). Nor could it be ascertained how far they extend inland from the banks of the river, but from the fact that the ore-belt is eleven hundred feet wide, and extends across the full width of the river, a distance of a quarter of a mile, the conclusion was reached that it will extend inland for a similar distance at least. This opinion can only be verified by boring or mining, and as many claims are staked back from the river information from drill-holes, etc., should soon be forthcoming as to the continuance of the ore inland.

In some places the ore is a soft, often botryoidal, vuggy limonite, in radiating, lumpy masses (Fig. 27). At other places it is a dense, hard hematite, or a compact limonite. Again it passes into coarse breccia, composed of fluted, water-worn fragments of the Corniferous limestone, and rounded boulders of siderite, the whole cemented by limonite; or at other places it is a quartz conglomerate, composed of small water-worn pebbles of quartz in a matrix of clay and limonite. Other phases show the ore as clay, impregnated by limonite, all stages of impregnation being found as shown by the following analyses:

	Iron, per cent.
1. Clay of the country in general	2.46
2. Clay visibly reddened by the presence of iron oxide	6.30
3. Clay of ochreous color	11.38
4. Clay decidely limonitic	28.25
5. Clay in appearance, but a low-grade limonite ore	33.19
6. Clay in appearance, but a good limonite ore	48.45

In the case of these clay-iron ores, the passage from one to another type is so gradual, and the clay characters are so well preserved, that there is no possible doubt of their forming one series. The deposits are of a mixed character, in some places the material being high enough in iron to constitute a good ore, but in other places the

[12]Geo. Sur. Can., 1875-6, p. 321.
[13]Bur. Min., Vol. XIII. (1904), p. 152.

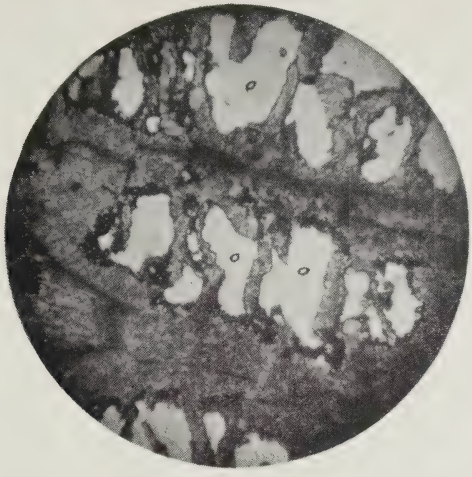


Fig. 29.—Ferruginous limestone with fossils unaltered.

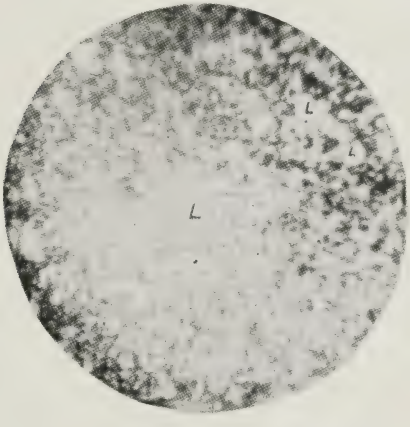


Fig. 30.—Ferruginous limestone, non-fossiliferous.

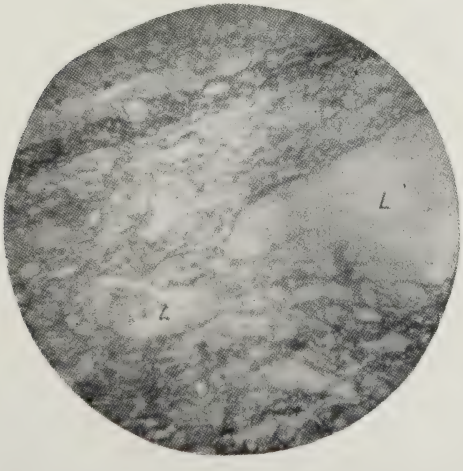


Fig. 31.—Limestone with limonite in lines of weakness.

percentage of iron in the alluvial accumulations is quite low. This fact is well demonstrated by the following analyses of selected samples from the ore-bodies.

No.	Iron.	S.	P.	Moisture.	———
1	52.45	0.14	0.08	1.16	Average of the best ore at the foot of the rapids on the north side.
2	52.10	0.11	0.14	0.94	Best ore below high water mark foot of the rapids on the north side.
3	41.68	0.15	0.12	1.7	Average ore from the foot of the rapids, south side.
4	37.35	0.16	0.13	1.56	Average of the best ore at the head of the rapids, south side.
5	36.68	0.60	0.09	1.42	Average of 850 ft. of exposure at the head of the rapids, south side.

None of these would be a Bessemer ore, but some are well suited for open hearth treatment.

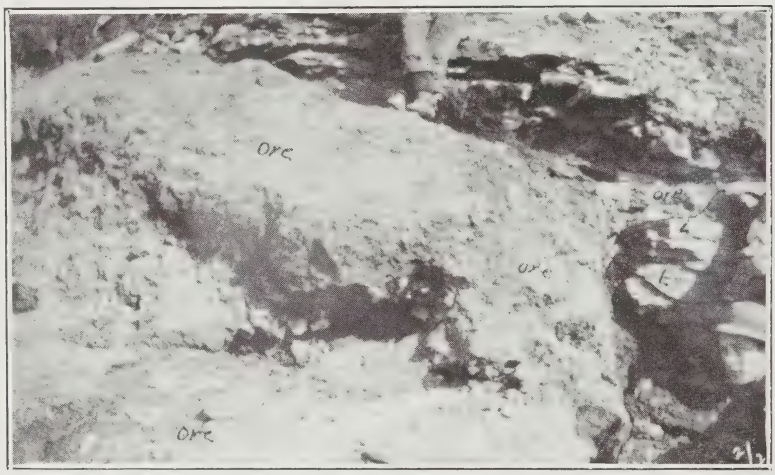


Fig. 32.—Ore in contact with limestone wall.

Origin of the Ore

Speaking of the Mattagami river deposit, J. M. Bell says:[14]

The limonite occurs at the base of cliffs of limestone, lying almost horizontally thirty to forty feet high, overlain by fine-grained boulder clays and silt. Its continuation toward the interior is hidden by these overlying rocks, and its appearance at the foot of the cliffs often obscured by the talus resulting therefrom. All the limestone overlying the ore contains iron carbonate, the lower part or that in close proximity to the ore being often decidedly ferruginous. The mass of the ore has resulted in part from the direct oxidation of the siderite in this iron-bearing limestone, and in part by the replacement of calcareous and other impurities contained within the iron carbonate of the limestone, by hydrous iron oxide, deposited either as siderite and subsequently oxidized, or directly as hydrous iron oxide in cavities. This ferruginous material is brought in solution as carbonate by waters containing carbon dioxide, and is doubtless leached from the wide area of siderite-bearing limestone above the ore stratum.

From the foregoing it is clear that Mr. Bell believed that the ore was due to the leaching of the Devonian limestone. Dr. Robert Bell, however, in his report of 1875, says:

The geological relations of this singular deposit are puzzling. It may be of newer date than the limestone gorge in which it occurs. The adjacent overlooking wall of soft earthy limestone is worn into vertical caverns, with fluted and rounded walls, like

[14]Bur. Min., Vol. XIII. (1904), p. 152.

the sides of great pot-holes (Fig. 28). They are sometimes partially lined with a thin coating of a highly ferruginous carbonate. The iron ore was nowhere seen in contact with the rock.

Regarding the origin of the ore, the writer is of opinion that it was not derived from the Devonion limestone, but rather that the limonite and hematite are due to the oxidation of the Animikie siderite, found in place at the head of the rapids and already referred to. This Animikie siderite is believed to exist at many places about the edge of the Paleozoic coastal plain. In reading the reports on the various rivers of this area one is impressed with the regularity with which iron-holding deposits occur about the edge of the basin, and it would appear that about the margin of the Paleozoic area, where the sediments are naturally thinnest, they are eroded in many places so as to actually expose the underlying siderite. The weathering of the siderite produced residual limonite and hematite, or supplied springs or other waters with a load of iron carbonate, to be carried to new resting-places, there to be oxidized and deposited as limonite, hematite or magnetite, the last of which was found in a few cases. Professor Van Hise, in his treatise on "Metamorphism,"[15] accounts for such deposits as follows:—

4 $FeCO_3 + 2O + 3H_2O = 2\ Fe_2O_3 3H_2O$ (limonite) $+ 4CO_2$.
or 2 $FeCO_3 + O = Fe_2O_3$ (hematite) $+ 2CO_2$.
or 3 $FeCO_3 + O = Fe_3O_4$ (magnetite) $+ 3CO_2$.

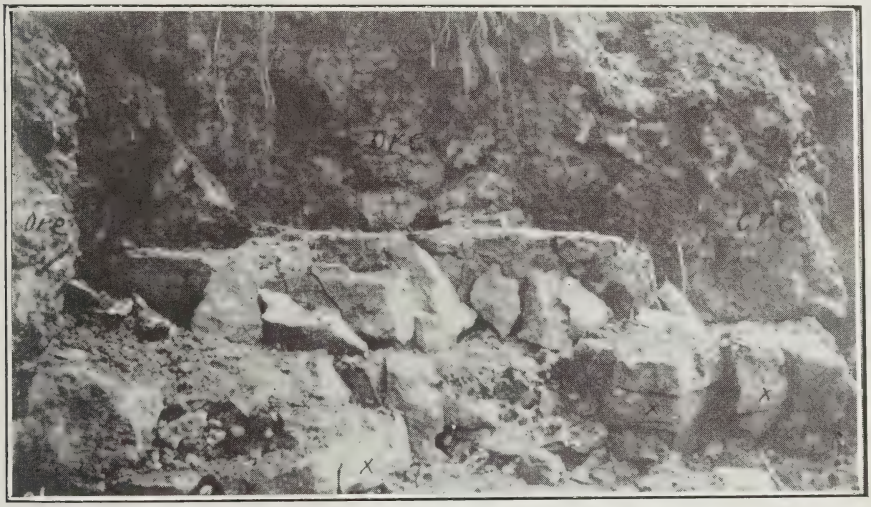


Fig. 33.—Ore body resting on limestone.

The natural exposures at no place showed ore in actual contact with the limestone, so that its relationship to the wall-rocks could not be seen. Several of these deposits were therefore stripped to show the contacts, and a party of men doing assessment work for Mr. Foster Shields also uncovered contacts, so that the fluted water-worn cavities could be easily seen and were very characteristic. In these cavities in the Corniferous limestone the iron-bearing waters have deposited their loads chiefly in the form of limonite, which in some cases has been altered to hematite.

It is evident that the cavities were made before the ore was deposited, and not by replacement or any such process, for there is only the slightest amount of replacement to be seen, even in the most suitable places. Fossiliferous portions of the limestone

[15]Monograph XLVII., p. 233.

show the ore filling the pores of the fossil, while the calcareous frame-work is entirely unattacked (see Fig. 29). At other places where the limestone is not fossiliferous, the grains of the calcite can be clearly seen to be intact, while the limonite is present as interstitial filling (see Fig. 30), or as streaks along the lines of weakness in the limestone (see Fig. 31). Moreover, the ore is in sharp contact with the fluted pot-hole-like walls of the limestone (see fig. 32), showing clearly that the ore-bearing waters found the cavities waiting for them.

Limestone not Source of Iron

In accounting for the supply of iron to form such deposits it would not appear that the Devonian limestone is sufficiently rich in iron to have supplied the requisite



Fig 34.—Ore showing inclusion of limestone blocks.

amount. In support of this conclusion may be instanced a deposit of good ore resting upon a limestone floor, shown in Fig. 33. There is a distinct knob of limestone sticking up within the ore-body, as shown in the photograph. From one of the layers of limestone, which by its thickness and other characters could be followed from side to side, samples were taken from each contact, at equal distances in from the contact towards the middle of the body, and at the middle. The analyses of these are quite instructive, for they show that proceeding from the ore into the limestone there is less and less iron, and a perfect correspondence in the decrease as well.

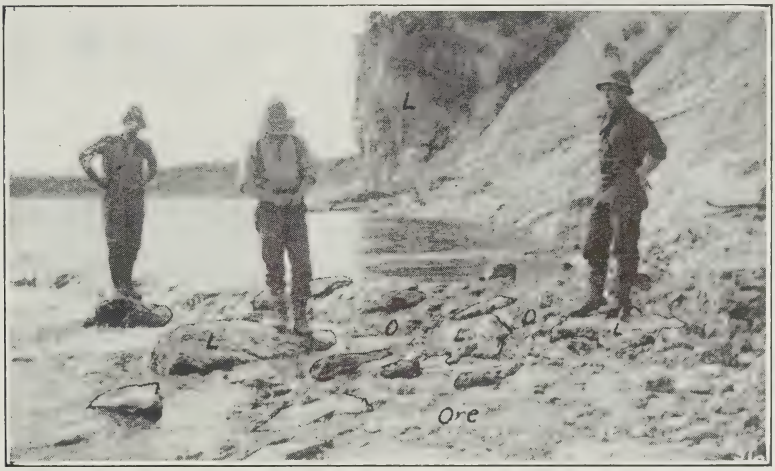


Fig. 35.—Ore showing inclusion of limestone blocks.



Fig. 36.—Ore showing glacial striations.

	Iron per cent.
Sample No. 1—At the actual contact, left side of exposure	6.50
Sample No. 2—2 inches in from the contact, left side exposure	3.22
Sample No. 3—1½ feet from the contact, left side exposure	1.80
Sample No. 4—Centre of body	0.65
Sample No. 5—1½ feet from contact, right side	1.28
Sample No. 6—2 inches from the contact, right side	3.58
Sample No. 7—Actual contact, right side	9.90

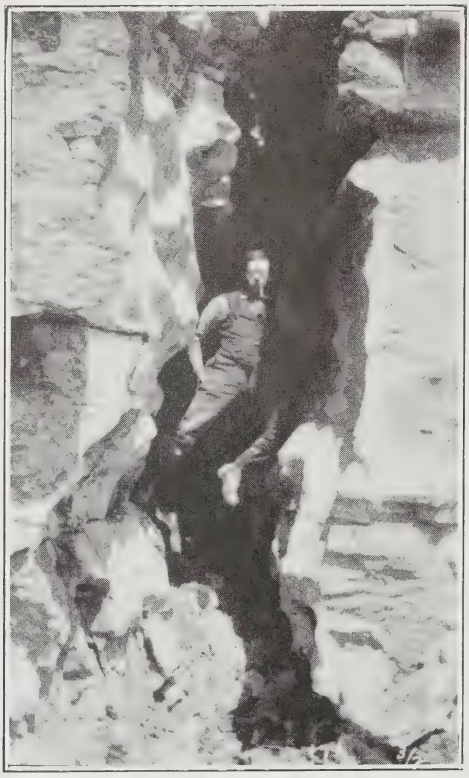


Fig. 37.—Enlarged joint-plane in limestone cliff.

The various evidences cited above show clearly that the iron in the Devonian limestones found its way into them from cavities rather than in the reverse direction. Attention is also called to the large blocks of fresh limestone sometimes found included in the ore (see Figs. 32, 34, 35), and to the sharp, clean contacts between them and the ore, showing absolutely no signs of replacement or decomposition. They are simply pieces of the wall-rock that have been water-worn, and later buried by the ore deposition. Moreover, with all the stripping and uncovering of ore that was done during the summer by Mr. Shields' men and those of my own party, not a single instance was observed in which the limestone overlaid the ore. In every case the ore occupied an open pocket or basin, with nothing but loose glacial or other drift above it. The various photographs taken of these contacts supply indubitable testimony that the cavities were made before the ore was deposited.

The exposed ore is therefore post-Devonian in age, and most of it is pre-Glacial, for rounded boulders of it are found in the glacial drift as far south as the Long Portage, a distance of twenty-five miles. Moreover, the ore itself is distinctly glaciated

in places (Fig. 36), one piece brought home showing distinct glacial striæ. A small portion of the ore is a cemented glacial drift, and some of it is certainly modern, for it can be seen forming in many local hollows, and along the banks of the river in many places, where chalybeate springs issue. This seepage from the banks is so laden with iron oxide that sevefal prospectors reported the country to be rich in petroleum, mistaking the scum of iron oxide for oil stains. These latter occurrences, however, are of insignificant extent, and so poor in iron content as not to be regarded as ore. Practically all the real ore is pre-Glacial in age.

Origin of the Cavities

The origin of the cavities or pockets that now hold the ore can only be surmised. One thing is evident, however, that they are water-worn, erosion channels, and to some degree solution spaces, in the limestone. The general character of them is well seen in Fig. 37, which shows them to be original joint cracks of the limestone, widened by solution and erosion to very large cavernous passages. These particular cracks extend not only down the full height of the cliff to the water, but can be seen from the top of the cliff to preserve the same course out into the rapids as far as they can be followed.

It is very doubtful if this coastal plain was under water again after the Devonian limestone was laid down until Pleistocene times, for no higher sedimentary horizons have been discovered in this area, and it is not conceivable that glaciation would have removed every vestige of them had they been present. If, therefore, this plain was a land surface from the close of the Devonian till the Pleistocene, with its drainage by lakes and rivers as now, it can be easily imagined that the thinner places, for example the edges, should be eroded through in many places to the underlying pre-Cambrian, and many of its main fractures, or joint planes, enlarged to irregular cavities by drainage waters.

It has already been pointed out that what was believed to be Animikie siderite was found *in situ* (see Fig. 16), in the immediate vicinity of these deposits. From this and similar occurrences of siderite seen by others in this basin, there can be no doubt that many outcrops are covered only by glacial drift, as these would also be were they not exposed by the present rivers having cut through the drift to the bed rock. With these basins, pockets, and drainage channels in the limestone, and the rich deposits of siderite in the immediate vicinity, it is an easy matter for the iron carbonate to be dissolved, carried with the drainage waters, oxidized, and deposited in the various forms in which it is now found.

Where the limestone has been eroded or dissolved through to the underlying siderite, deposits of weathered limonite on top might be expected, which would change with depth to siderite, thus accounting for occurrences such as Dr. Robert Bell reports:[16] It will be noticed that the only places where iron ores are reported about this basin are where the present rivers have cut through the drift to bed rock, and as already mentioned, it is only here that the rocks outcrop. In all other localities from twenty to seventy feet or more of glacial drift, overlaid by the later shell-bearing sand series already described, cover the deposits. There is therefore good ground for the belief that were it not for the drift much more iron would be exposed than can now be seen.

It is possible that this Animikie siderite itself could easily become an ore. It is exceptionally high grade, as shown by the following complete analysis:

SiO_2	Al_2O_3	FeO	Fe_2O_3	MnO	CaO	MgO	CO_2	Carbon	S	H_2O	Sp.G.
1.40	2.31	54.31	1.67	1.74	1.47	Trace.	34.94	1.27	0.0	0.50	3.63

[16]Geo. Sur. Can., 1875, p. 321.

This analysis gives 43.27 per cent. iron, and by simply calcining the siderite over a Bunsen burner the carbon-dioxide was driven off, giving a product which analysed 63.74 per cent. iron. in many parts of Europe spathic iron ores, of much lower grade than this, are calcined; in some cases in open heaps, sometimes in continuous kilns, and sometimes in roasting furnaces, using gaseous fuels. It is possible, therefore, that with a high grade siderite, plenty of local fuel, for example lignite, or peat, or charcoal made from the birch forests of the north country, this siderite could be easily converted into a high grade ore, thereby reducing the freight rates to such a degree as would allow of the long haul necessary to bring them to the smelters. Without wishing to be too optimistic, it would appear to the writer that this is a phase of the question worthy of some consideration.

NOTES ON THE SALT INDUSTRY OF ONTARIO

BY N. L. BOWEN

Introduction

Salt was first discovered in Ontario near Goderich in 1865 while drilling was being carried on for oil. Other wells were put down with salt as their object, and a stable industry was established which has continued till the present time.

Distribution and Occurrence of Salt

The area in Ontario in which salt is now known to occur, lies entirely in the southwestern peninsula bordering lake Huron, the St. Clair river, lake St. Clair and the Detroit river. It exists as beds in the Salina formation of the Silurian system, which formation in the productive area is covered by upwards of 1,000 feet of other strata, chiefly Devonian.

Origin and Nature of Beds

Salt is the mineral halite, chloride of sodium, and is the chief dissolved constituent of sea-water. Beds of the mineral are believed to have been formd by partial evaporation of a cut-off arm of the sea or of a salt lake. In Salina time, conditions favoring this prevailed over much of southwestern Ontario, and the states of Ohio and New York. Such exploratory boring as has been done indicates that a number of separate, relatively small, basins were formed rather than a single large one. The beds range from mere seams to those two hundred feet and more thick.

Other salts of sea water separate in greater or less amount during the process of evaporation. Thus gypsum, hydrated sulphate of calcium, commonly accompanies salt, but is usually in distinct beds owing to the very different solubility. The salt itself always contains some chloride and sulphate of calcium or magnesium or both.

Analysis of Rock Salt

Being diamond drill core from Attrill's well, Goderich.

	Per cent.
Salt, NaCl	99.687
Chloride of calcium, $CaCl_2$	0.032
Chloride of Magnesium, $MgCl_2$	0.095
Sulphate of calcium, $CaSo_4$ (with water-gypsum)	0.090
Insoluble water	0.017
Moisture	0.079
Total	100.000

Extraction

All salt is procured in Ontario by allowing water to penetrate to the beds, a brine being thus formed. This is pumped to the surface, where by various processes of evaporation the salt is recovered.

Drilling Wells

The drilling of wells is accomplished by churn drills; a heavy bit on the end of a cable is lifted a few feet and allowed to fall about once a second and by its impact cuts its way into the strata. The drill is taken out every hour and the cuttings and sludge removed from the hole by means of a cylinder with valve bottom. The diameter of the hole is about 8 inches.

Piping

Piping through which the brine may be pumped to the surface, is then put in. The system of piping varies at different plants. If the water used to form the brine is simply ground water (that is, water which circulates in porous strata and runs into the well of its own accord) a single pipe, extending to the salt, with the plunger of the pump put down to the depth necessary to raise the brine, is all that is required. An objection sometimes raised is that ground water often carries much gypsum in solution, and in this way an undesirable substance is introduced into the brine and thence to the salt.

At some plants where a supply of lake or river water is available advantage is taken of this purer water. In this case, it is necessary to have double piping. Between the outer and inner, fresh water is forced down and in the inner brine rises to the surface. The case pipe, as in general use, has an internal diameter of 6¼ inches, and the brine pipe 3½ inches. This system has the further advantage that the head of water is sufficient of itself to raise the brine to within a short distance of the surface, not however the whole distance since the brine is denser than the fresh water. It is of advantage that the brine pipe should reach to the bottom of the solution cavity formed in the salt bed for here the heavier and more saturated brine occurs. The case pipe, on the other hand, is not extended to the bottom, but is caused to rest on a firm rock ledge above the salt stratum, the joint being made 'tight' by a heavy rubber collar on the end of the pipe. The system must have no leaks for in such case the "head" is lost.

When a large quantity of salt has been dissolved out, overlying strata, if of a weak character, often cave in and break the pipes and many annoying delays are thus occasioned. In such cases it is necessary to drill through the broken debris and extend the pipe to the bottom.

The contract price for drilling is at present $1.65 per foot, the average cost of a well complete and ready for pumping being about $5,000.

The Brine

The brine as it comes to the surface is, when the system is working properly, a completely saturated solution of salt. A simple density test with a salometer suffices to ascertain the saturation. The salometer is a hollow tube weighted in one end. It floats in an upright position in the brine, and at different levels, according to the density of the brine. The tube is calibrated to read 100 when saturation is complete—that is, when the water has dissolved all the salt it will dissolve. The proportion is roughly 75 parts by weight of water to 25 of salt.

Treatment of Brine

The brine is first pumped to the settling tanks, where any sediment is allowed to settle and where at some plants it is treated with lime, which causes the precipitation and removal of iron and any bicarbonates. In most cases such treatment is quite unnecessary.

Analysis of an Ontario Brine

	Per cent.
Sulphate of calcium	0.4406
Chloride of calcium	0.062
Chloride of magnesium	0.027
Salt	25.68
Water	73.78

Evaporation

The brine now runs to the evaporating pans, which may be one of several types, but which separate themselves into two classes.

1. Open pans.
2. Vacuum pans.

In open pans the brine is heated in contact with the atmosphere, and as the water evaporates salt is deposited and raked out.

Open pans proper, as referred to in the trade, are large flat pans, commonly 100 x 40 feet, with a depth of 2 feet. Beneath one end is a fireplace and the direct heat plays on the pan. Evaporation at the fire end is brisk, the brine boiling vigorously, and the salt separates in fine crystals. Farther from the fire evaporation is more retarded and coarser and coarser crystals separate with increasing distance. In this way the product is graded.

Salt crystals form at the surface, since it is there the water vapor is lost to the atmosphere. They sink to the bottom because heavier than brine, and from there are raked out. Raking is accomplished by hand or by different mechanical devices, such as an endless belt with rakes, or an oscillating beam with rakes so spaced that the load brought forward and dropped by one is picked up by its neighbor and thus moved on another step.

Sometimes, instead of direct fire, steam heat is used. In this case steam pipes are hung within the pan, or a steam chamber is constructed beneath the pan, and when steam is let in uniform evaporation of the brine ensues. Such pans are called "grainers." The rapidity of evaporation and therefore the coarseness of the salt can be easily regulated. This method is often used where a supply of exhaust steam is available, and in such case affords a very economical means of evaporating. Raking may be mechanical, or by hand, as in the "open pan" method.

Behaviour of Foreign Constituents

The level of the brine in pans of all types is kept approximately constant by a continuous flow of new brine, which takes the place of evaporated water. The chlorides of calcium and magnesium do not separate with the salt, and there is, therefore, an increasing concentration of these salts in the pans. The brine is said to become "sour." If allowed to continue, the brine will become saturated with these chlorides and they will be deposited in considerable amount. They have such a strong attraction for water that if contained in salt, except in the minutest quantity, they render it continually damp, thus causing it to cake. The process must, therefore, be interrupted every two or three weeks to run off "souring" brine.

Most of the gypsum which separates tends to form a coating which adheres firmly to the pans and is removed at intervals by scraping. This action of gypsum is due to the fact that a great deal of it separates not on account of evaporation, but simply on account of the raising of the temperature of the brine, calcium sulphate, unlike salt, being decidedly less soluble in water at the boiling temperature than in cold water. Since it is at its contact with the pan that the solution first feels the temperature effect, it is here that the gypsum separates. So also the steam pipes of grainers become coated.

At some of the plants one end of the open pan is reserved for simply warming the brine before it passes to the evaporators. Although this is done merely to keep the evaporators from getting "off the boil," it has the additional advantage of taking out much gypsum. Gypsum is not an especially objectionable impurity in salt, but is of course undesirable.

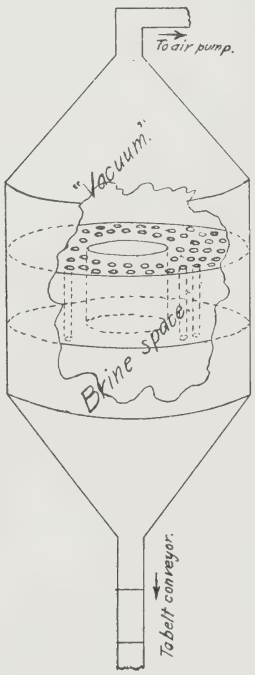
Vacuum Pans

In vacuum pans the brine is caused to boil under reduced pressure, the boiling point being lower as the pressure is lower. Vacuum pans are therefore closed pans, or really tanks, in which the brine rises to a certain level, and above this a reduced pressure is maintained by means of an air pump. Heat is supplied by steam. The brine circulates in the tubes of a drum about centrally placed in the tank and steam is contained in the space between the tubes. Fine-grained salt forms rapidly and settles through the boiling brine down a pipe, where by a double valve arrangement it passes out and is picked up in the scoops of a belt conveyor. A rough idea of the construction is to be obtained from the following sketch.

This is, on account of the low boiling point of the brine, an especially effective method of using exhaust steam.

The plant is sometimes arranged in "double effect," that is, the steam from the brine in the "first effect pan" passes over into the steam drum of a "second effect pan," where a greater vacuum is maintained. The temperature of the steam is sufficient to cause the brine to boil under its further reduced pressure. In this manner greater efficiency is obtained from a given amount of steam.

In the first effect pan a vacuum of about 24 inches is commonly maintained, that is, the pressure is equal to 6 inches of mercury, or is one-fifth of the atmospheric pressure of 30 inches. At this pressure the brine boils at about 155° F. In the second effect pan a vacuum of about 27 inches is maintained, the pressure then being about one-tenth the atmospheric pressure. The brine boils at about 105° F. The single effect



Vacuum Pan.

process must be interrupted about every 12 hours in order to clean the tubes of gypsum coating, to accomplish which it is necessary to resort to drilling. So also in the double effect process, the first effect pan must be cleaned every 12 hours, but the second effect pan needs to be cleaned of gypsum only every year. This affords a striking example of the effect of temperature in precipitating gypsum, that in the first effect pan being so decidedly higher than that in the second effect.

In vacuum pans the finest grades of table and dairy salt are made.

Drying

By whatever method made, the salt must first be dried. This is accomplished at some plants simply by allowing it to drain thoroughly. At the larger plants it receives a further drying in the drying drum. This is a revolving cylinder, 20 to 30 feet long and 6 to 8 feet in diameter, placed with its axis at a small angle from the horizontal. The salt enters at the higher end and passes slowly to the lower, always forming a thin layer on the inside of the cylinder and being exposed to a moderately high temperature.

Sizing and Packing

The salt is then sized by bolting. The product of all grades is thus made up of individual crystals, this being much preferred in the trade to ground salt.

The different grades pass to the packing rooms, where they are put into barrels, bags, or packages, according to the use for which they are designed. Most of the works have their own cooper shops.

Price of Salt

The price of the product varies greatly for the different grades, the average being about 90 cents per barrel of 280 lbs.

Market

The bulk of the salt manufactured is used in Ontario; a considerable proportion goes to the Western provinces, and a smaller quantity as far east as the Maritime provinces. The chief competitors in the market are English and American salt. A reference to the table of imports of salt and production of the same given later shows that the amount imported into Canada in one year is nearly twice the domestic production, although the total value of imports is somewhat less. This is due to the fact that it is largely the cheaper grades of salt which are imported.

When coming from the United Kingdom, salt enters Canada duty free. If for use in sea or gulf fisheries, it enters free from any source. On salt designed for other uses and coming from countries other than the United Kingdom, duties are imposed as follows:

Salt packages from United States..... 25 per cent. ad valorem.
Salt in bulk from United States..... 5 cents per 100 lbs.
Salt in bags, barrels, etc., from United States..... 7½ cents per 100 lbs.

Some protection is thus afforded the Canadian producer, but it is claimed that even in Ontario American salt is used to some extent in butter making.

Uses of Salt

The uses of salt are well known to all. The finest grades are used for the table and dairy, coarser grades for packing meats, curing hides, feeding to cattle, and for an endless variety of purposes. Crude salt, including the scrapings of the pans and the sweepings of the floors, is often used as fertilizer under the name of "land salt." This is, of course, entirely used locally, as it will not bear transportation. It is claimed that good results are obtained.

Salt is also the raw material from which practically all soda and chlorine products are manufactured. These include the common baking soda, washing soda, caustic soda (the base of soap), muriatic acid, bleaching powder, chlorates and a number of other materials which have come to be necessaries of life.

Supply and Demand

The Ontario supply of salt is, to all intents and purposes, inexhaustible. When it is pointed out that a bed 30 feet thick, extending over an area of one acre, would contain over 80,000 tons (equal to the yearly production), and that there are several such beds, extending over many thousands of acres, one realizes how true this statement is. The production is limited only by the demand. This would be increased by greater success in competition with foreign salt, or by the establishment on the ground of chemical industries in which salt is used as a raw material.

This latter is an especially desirable departure in Ontario, as will be seen from the table of imports of soda and chlorine products into Canada, given later.

Salt Plants

Canadian Salt Company, Windsor

The plant of the Canadian Salt Company at Windsor is the largest in the Province. Most of the salt is made in a double effect vacuum pan system. Two first effect pans are run alternately in connection with the one second effect pan. While one of the former is in use the other is being cleaned of gypsum, a process which is necessary every 12 hours. The second effect pan is cleaned every 36 hours by boiling. The first effect pans are each 12 feet in diameter and the second effect 20 feet.

Coarser salt, also, is made at this plant in two steam-heated grainers, the temperature maintained in these being about 185°. The fuel used in the boilers is natural gas.

River water is forced down to the salt beds to form the brine. Four beds of salt have been penetrated, the upper 90 feet thick, the next 30 feet, the next 35 feet, and the lowest 200 feet. There are five wells on the block, three in the top salt with a depth of about 1,200 feet, and two in the bottom salt with a depth of about 1,700 feet.

The output of the plant is about 1,200 bbl. per day, the capacity being considerably greater. Employment is given to 120 persons. Shipping facilities, both by rail and by water, are of the best.

The Canadian Salt Company has another plant at Sandwich, with an output of 400 bbl. per day, made by the grainer method. It is planned to construct at the Sandwich block a plant for the manufacture of soda and bleaching powder by an electrolytic process.

Dominion Salt Company, Sarnia

The Dominion Salt Company is the name under which the Cleveland-Sarnia Lumber Company conducts its salt business. The plant is that formerly operated by the Empire Salt Company.

There are in use two grainers and a single effect vacuum pan 10 feet in diameter. The brine is obtained from two wells, and a third was being drilled at the time of the writer's visit. River water is used. Following is a rough log of one of the wells:

1,627 feet "rock."
35 feet salt.
12 feet limestone.
126 feet salt.

Exhaust steam from the saw mills is made use of. This is not alway available, so the plant does not run to full capacity. Only when there is excessive demand for salt is coal fuel resorted to. One thousand bbl. per day could be made. The daily average of the total production for 1909 was about 410 bbl. Thirty-five persons are employed on the block. Transportation facilities are the very best.

Empire Salt Company, Sarnia

This company is not at present producing salt, but plans the erection of a 1,000 bbl. per day plant on the Indian Reserve south of Sarnia.

Western Salt Company, Mooretown

At this plant the open pan method is in use. The pan is 90 feet long and 20 feet wide, and is heated by a coal fire. The salt is raked out by hand. The brine comes from one well 1,870 feet deep. The saltbed is 100 feet thick and there is good reason to expect another at 2,200 feet.

Thirteen persons were employed during 1909 and 12,674 bbl. shipped. The company plans the erection of a plant at Sombra.

Elarton Salt Company

At this plant the open pan method is in use. The pan is 60 feet long and is heated by a wood fire. The well is 1,460 feet deep and the salt is 130 feet thick with partings of shale.

Ground water leaks into the well and forms the brine.

The plant is in operation only a part of the year and supplies only local demand.

Western Canada Flour Mills Company, Goderich

This company operates a salt block in connection with the mills. Two open pans are in use and are heated by exhaust steam from the mill, which is let into the steam chamber beneath the pans, only coarse salt being made.

The brine comes from one well 1,100 feet deep, extending 16 feet into a salt bed of unknown thickness. Two pervious strata at 260 and 340 feet supply an abundance of water. An excellent log of a Goderich well is given later in the results of diamond drilling at that place.

The output is about 220 bbl. per day, all of which is shipped by rail to Ontario points. Seven men are employed.

Ontario People's Salt and Soda Company, Kincardine

At this plant there is in use a large V-shaped grainer 100 feet long and 13 feet wide, with a depth of 7 feet and a width of 18 inches at the bottom.

Tiers of steam pipes are placed in this, and into these live steam is turned. The brine is kept at a very gentle boil. Fine-grained salt settles and is taken out by an endless chain conveyor.

In a smaller and shallower pan, the steam is used a second time for slower evaporation at 150 to 160 degrees, making coarse salt.

Both pans are emptied every three weeks as the brine begins to "sour," and the process is renewed with fresh brine. Two beds of salt have been penetrated, the one 28, the other 33 feet thick. About twelve men are employed and produce 135 bbl. per day, all of which is used in Ontario. About 10 tons of coal, costing $2.75 per ton, are used in one day.

Some twenty years ago, an electrolytic soda plant was established at this works, but the process was unsuccessful, and no soda was made.

Gray, Young and Sparling Salt Company, Wingham

At the plant operated by this company, two open pans are alternately in use. The well is situated 2 miles from the works and the brine has to be pumped this distance. It is 1,185 feet deep, with 30 feet of salt.

Seven men are employed, making about 600 bbl. a week, or about 80 tons, for which about 40 tons of coal are consumed. The plant produces at this rate for only part of the year, nearly all of the production being consumed locally.

Stapleton Salt Company, Stapleton

At Stapleton, salt is made by the open pan method. Eleven men are employed and the product is, at full capacity, about 100 bbls. per day. There are three beds of salt with a total thickness of 100 feet. The plant is advantageously situated for rail shipment.

Exeter Salt Company, Exeter

At Exeter, the open pan method is used. The brine comes from one well in which it is 1,014 feet to salt with a thickness of 125 feet, including shaly partings. Six men are employed, and about 800 tons made in the year, all of which is used locally.

Parkhill Salt Company, Parkhill

At Parkhill salt is made by the open pan method. Five men are employed, working only six weeks in the year. All the salt is used in the neighborhood. The brine comes from one well 1,285 feet deep with four beds of salt, each 15 feet thick.

Logs of Wells

In describing the individual plants, the thickness of salt beds penetrated has been given, but no complete logs. Following is a list of logs which give a clue to the underground geology of the different parts of the salt area. Many more could be given, but the number has not been needlessly multiplied.

Windsor Well.			A Courtright Well.		
	Ft.	Total Ft.		Ft.	Total Ft.
Drift			Drift	160	160
Limestone	570	570	Shale (black)	32	192
Sandstone	130	700	Limestone	40	232
Limestone	356	1,056	Shale and limestone	310	542
Salt	90	1,146	Limestone	520	1,062
Limestone	30	1,176	Sandstone	32	1,094
Salt	30	1,206	Limestone	536	1,630
Limestone	100	1,306	Salt	22	1,652
Salt	35	1,341	Gypsum	13	1,665
Shale	100	1,441			
Salt	200	1,641			
Limestone					

Dictated by the driller from memory.

A Sarnia Well

	Ft.	Total Ft.
Drift	122	
Black shale	40	
Limestone	80	
Shales	185	
Limestone	30	
Shales	46	
Limestone	987	
Gypsum	5	
Shales and Salt	15	1,510
Salt	56	
Shales	18	
Salt	30	1,614

A Petrolia Well

—	Ft.	Total ft.	—
Drift	90	90	
Shale	240	330	Hamilton.
Cherty limestone	190	520	Corniferous.
Dolomite	690	1,210	
Salt	65	1,275	
Dolomite	20	1,295	
Salt with dolomite	140	1,435	
Dolomite	30	1,465	
Salt	90	1,555	
Salt with dolomite	50	1,605	Salina.
Salt	25	1,630	
Dolomite	10	1,640	
Salt	138	1,885	
Dolomite and shale	130	2,015	
Salt	90	2,105	
Dolomitic lime	275	2,380	Niagara.
Shale	150	2,530	Clinton.
Red shale	275	2,805	Medina.
Light shales	205	3,010	Hudson River.
Dark shales	165	3,175	Utica.
Limestone	772	3,947	Trenton.

A London Well

—	Ft.	Total ft.	—
Drift	130	130	
Limestone	1,170	1,300	Corniferous.
Salt and shale	100	1,400	Salina.
Black shale	200	1,600	Clinton and Niagara.
Red shale	500	2,100	Medina.
Limestone and shale	150	2,250	Hudson River.

A Goderich Well (Diamond Drill)

Dolomite with limestone layers	278 ft.	3 in.
Limestone with corals, chert and beds of dolomite	276 "	0 "
Dolomite with seams of gypsum	243 "	0 "
Variegated marls with beds of dolomite	121 "	0 "
Rock salt (1st)	30 "	11 "
Dolomite with marls	32 "	1 "
Rock salt (2d)	25 "	4 "
Dolomite	6 "	10 "
Rock salt (3d)	34 "	10 "
Marls with dolomite and anhydrite	80 "	7 "
Rock salt (4th)	15 "	5 "
Dolomite and anhydrite	7 "	0 "
Rock salt (5th)	13 "	6 "
Marls, soft, with anhydrite	135 "	6 "
Rock salt (6th)	6 "	0 "
Marls, soft, with dolomite and anhydrite	132 "	0 "
	1,517 ft.	

Stapleton Well (near Clinton)

Drift	67 ft.
Limestone	413 "
Limestone, cherty and dolomitic	204 "
Limestone	176 "
Limestone, cherty	36 "
Shale, limestone, gypsum and marls	255 "
Rock salt (1st)	15 "
Shale, gypsum and salt	48 "
Rock salt (2nd)	25 "
	1,239 ft.

A Kincardine Well

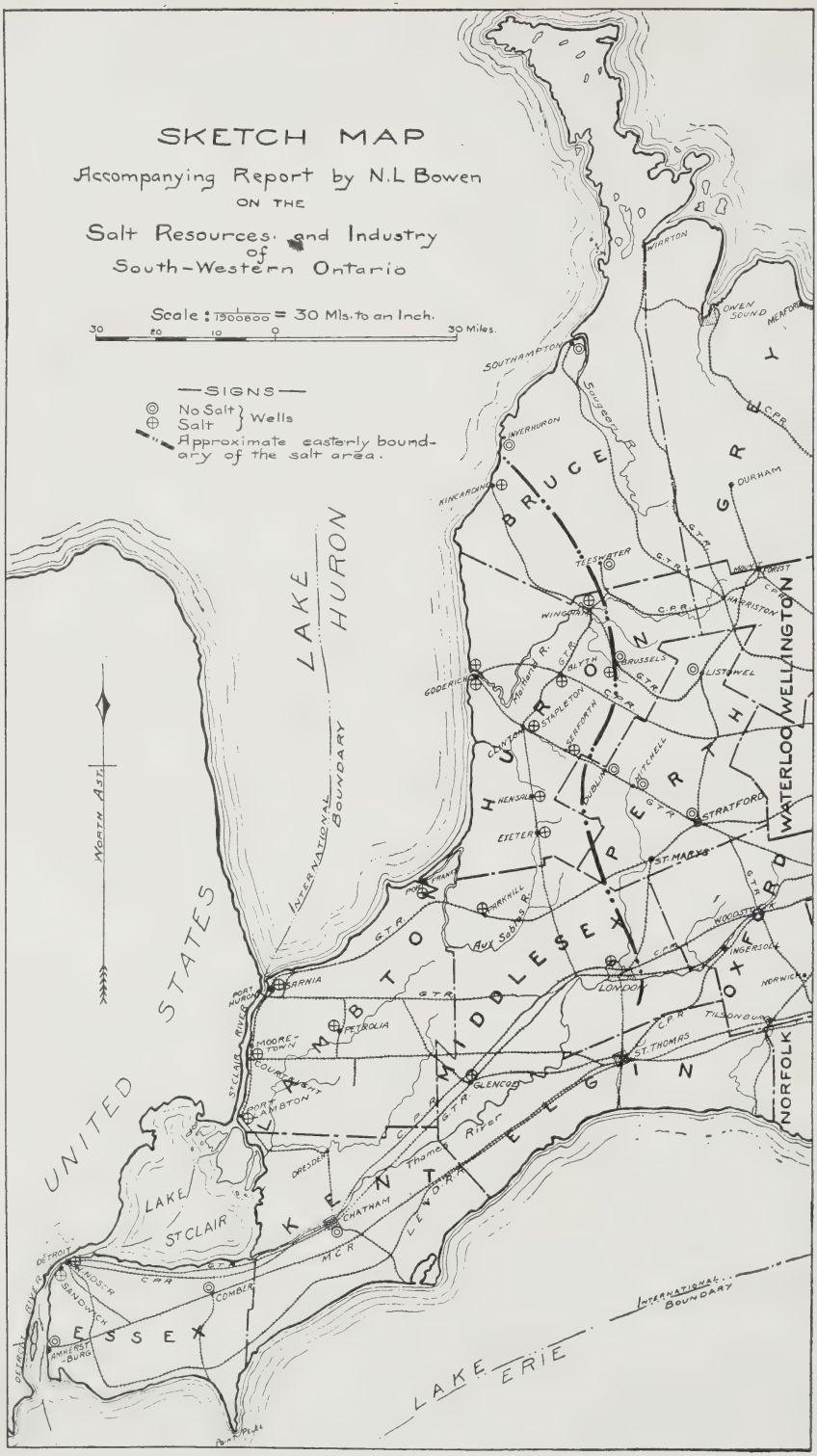
Drift	91 ft.
Limestone	509 "
Shale, red and blue	140 "
Limestone	30 "
Shale, blue and red	125 "
Rock salt	14 "
	909 ft.

Extent of Salt Area

But little exploration for salt has been carried on, largely because the production of a very few wells is sufficient to supply the demand. It might, however, be advantageous to know as far as possible the area which is probably underlain by salt beds, especially since opportunities may present themselves for the establishment of a salt industry or a chemical industry in a neighborhood where cheap fuel, cheap electrical power or some other industrial condition, would make such a course desirable.

A great deal of exploration for oil has, however, been carried on, and where the borings have extended below the salt horizon they, of course, give information as to the presence or absence of salt.

In the following, only borings which have certainly, or in all probability, extended below the salt horizon are given, and where no salt is reported the meaning is that there are no beds of rock salt. Significant localities are, beginning at the north:


SKETCH MAP
Accompanying Report by N.L Bowen
ON THE
Salt Resources and Industry
of
South-Western Ontario
Scale : 1/1000800 = 30 Mls. to an Inch.
30 20 10 0 30 Miles.
—SIGNS—
No Salt } Wells
Salt }
Approximate easterly boundary of the salt area.
LAKE HURON
INTERNATIONAL BOUNDARY
UNITED STATES
LAKE ST CLAIR
LAKE ERIE
INTERNATIONAL BOUNDARY
BRUCE
GREY
HURON
PERTH
WATERLOO
WELLINGTON
MIDDLESEX
LAMBTON
KENT
ESSEX
ELGIN
OXFORD
NORFOLK
WIARTON
OWEN SOUND
MEAFORD
SOUTHAMPTON
INVERHURON
KINCARDINE
DURHAM
TESWATER
WINGHAM
HARRISTON
BRUSSELS
LISTOWEL
GODERICH
STRATFORD
ST. MARYS
HENSALL
EXETER
PORT FRANK
PARKHILL
WOODSTOCK
INGERSOLL
NORWICH
LONDON
SARNIA
PORT HURON
MOORETOWN
PETROLIA
COURTRIGHT
PORT LAMBTON
ST. THOMAS
TILSONBURG
GLENCOE
DRESDEN
CHATHAM
DETROIT
WINDSOR
SANDWICH
COMBER
AMHERSTBURG
St. Clair River
Thames River
NORTH AST.

Salt	No Salt
Kincardine	Inverhuron Southampton Port Elgin
Wingham	Teeswater
¾ mi. S.W. of Brussels	Brussels
Seaforth	Dublin Mitchell Stratford
London Glencoe	Tillsonburg Norwich
Pt. Lambton	Comber ? Chatham ?
Sandwich Windsor	Amherstburg ?

The query placed after some of the names indicates a doubt as to whether the borings have been sufficiently deep to reach the salt horizon in these cases. It may be that the salt area extends southward to Lake Erie, including the whole of Kent and Essex, but this can not be asserted. It is claimed that a boring in Orford township, Kent, struck salt 171 feet thick at a depth of 1,510 feet, but the writer could find no definite record of this well. The approximate eastern boundary of the salt area has been indicated on the map which accompanies this report.

Production

The salt production in Ontario since 1900 has been as follows:

Year.	Salt produced.	Value of product.	No. of workmen	Wages paid.
	tons.	$		$
1900	66,588	324,477	243	72,581
1901	60,327	323,058	189	67,024
1902	62,011	344,620	198	76,154
1903	58,274	388,097	208	87,995
1904	55,877	362,621	193	84,682
1905	60,415	356,783	148	68,580
1906	50,414	367,738	151	69,153
1907	62,806	432,936	194	85,935
1908	79,112	488,330	195	93,700
1909	77,490	389,573	176	89,995
1910	84,071	414,978	202	114,056

Imports

The imports of salt into Canada during 12 months ended March 31, 1910, were as follows:—

From	Tons.	Value.
		$
United Kingdom	64,613	256,442
United States	27,885	140,924
All other countries	41,400	67,808
Total	133,898	465,174

The imports of salt products into Canada during 12 months ended March 31, 1910, were as follows:—

——	Lbs.	Value.	Duty.
		$	
Soda (bicarbonate)	5,608,776	52,701	15 to 17½ per cent.
Soda (caustic)	11,686,641	232,843	Mostly free.
Bleaching powder	10,160,238	110,145	Free.
Other products (not complete)	.....	88,000	.....
		483,689	

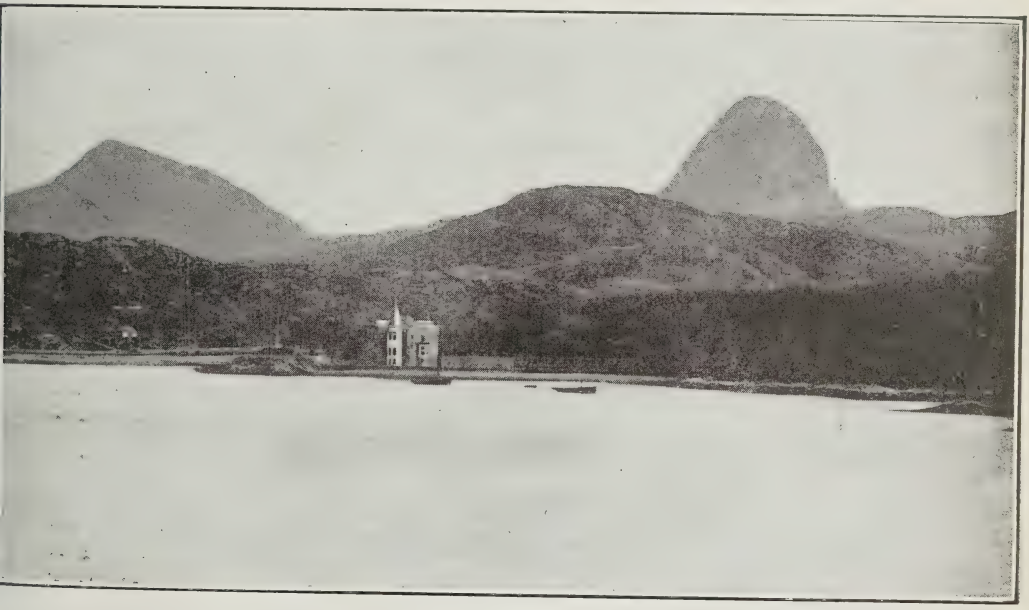
No soda or bleaching powder are manufactured at present in Canada.

A GEOLOGICAL TRIP IN SCOTLAND

Pre-Cambrian of Northwest Highlands compared with that of Ontario

BY WILLET G. MILLER

Scotland has been a great mother of geologists. At the end of the eighteenth century Hutton (1726-1797) with his "Theory of the Earth," and his disciple Playfair with the "Illustrations," placed the science on the road which it has since followed. The heroic struggle between the plutonists, as Hutton and his Edinburgh school were called, and the neptunists, or those who sided with the great Freiburg professor, Werner, was a memorable one. Among Scottish geologists who were connected with this controversy may be mentioned James Hall (1761-1832), to whom is due the establishment of experimental research as a branch of geological investigation, and Robert Jameson (1774-1854), who upheld the Wernerian system. Of this period were John Macculloch (1773-1835), an eminent pioneer worker on the pre-Cambrian and author of remarkable maps, and William Nicol (about 1768-1851), to whom the petrographical branch of the science is much indebted. William Maclure (1763-1840), born at Ayr, has been called the "Father of American Geology."



Culag Hotel, Loch Inver. Lewisian Gneiss in foreground, Mts. Canish and Suliven in background.

Then onward through the years there always have been eminent leaders of geological thought among Scotchmen, e.g., Murchison (1792-1871), the founder of the Silurian system, and Hugh Miller (1802-1856), whose writings did so much to popularize geology. To this list may be added the name of the Canadian, Logan (1798-1875), of Scottish ancestry and educated in Edinburgh. Among Scottish geologists still living may be mentioned the brothers Geikie, Sir Archibald and James, the former of whom by his text-books and other writings, has had a greater influence on students of the science than has any other author. Then there are Peach, Horne and other investigators, who have added much to our knowledge of the history of the earth. Most Scottish geologists have resided in Edinburgh and have doubtless received much of their inspiration from the surroundings of the city. Edinburgh is probably unsurpassed in the facilities it

offers to beginners in the study of geology. "On every side of us are incentives to study. Crag and hill rise around us, each eloquent of ancient revolutions, and each a silent witness of the revolution in progress now. At our very gates tower on one side the picturesque memorials of long silent volcanoes, with their crumbling lavas and ashes. On the other lies the buried vegetation of an ancient land, with the corals and shells of a former ocean."[1]

A cynic might say that Scotchmen take to geology for the same reason that they do to theology. In both sciences it is difficult at times to prove that the other fellow is absolutely wrong. This gives opportunity for agument. But whatever be the explanation of the mental attitude of the people towards other sciences, the character of the country has doubtless had much to do with the popularity of geology:—

"O Caledonia! stern and wild,
Meet nurse for a poetic child!"

or, let us add, for a geologist.

The Pre-Cambrian

While Scotland offers classic localities to students of most branches of geology, its pre-Cambrian rocks will appeal strongly to the majority of Canadian students of the science. Our country has a greater expanse of these rocks than has any other land—approximately half of it, or 1,900,000 square miles, being underlain by rocks of this age.

Northwest Highlands

Owing to the importance of a close study of the pre-Cambrian rocks in this country, it is of great value to workers here to have an opportunity of visiting areas of rocks of like age in other countries, especially where they have been studied and mapped in detail. For this reason the writer, while on a trip to Europe during the past summer, spent as much time as possible in the Northwestern Highlands of Scotland, a region which has been studied closely by three or four generations of geologists. It has been mapped in greater detail than has any other pre-Cambrian region in the world, and it exhibits some of the most striking illustrations of pre-Cambrian stratigraphy and structure to be found anywhere.

The success of my visit to the Highlands was due chiefly to Dr. John Horne, F.R.S., of the Geological Survey, who, while I was in Edinburgh, kindly drew up a daily programme for me, so that I might see typical localities of the pre-Cambrian rocks and of their structural relations in the all too brief time I had to devote to the trip.

Itinerary

From Edinburgh I proceeded to Inverness, thence northwestward to Lairg. Here motor stage was taken to Loch Inver, on the northwest coast, where there are striking exposures of the Lewisian, reminding one forcibly of the typical Laurentian gneiss of Canada.

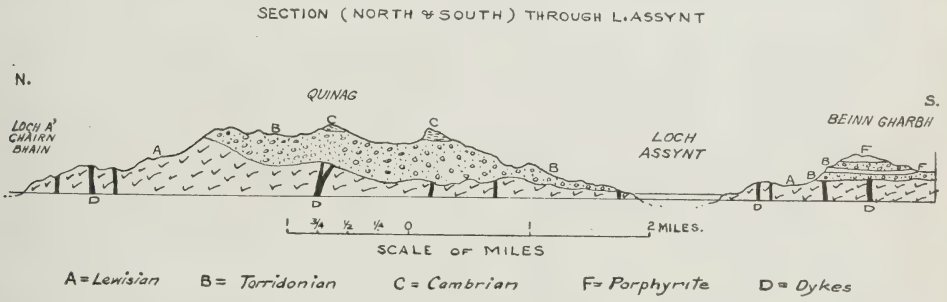
Having examined exposures of the basement rocks at Loch Inver the route was retraced eastward to Inchnadamff and Loch Assynt. Immediately north of Assynt is the mountain Quinag, extreme summit 2,653 feet. At its base is the Lewisian gneiss which is overlain by Torridon (pre-Cambrian) sandstones. The summit is capped by a small outlier of Cambrian quartzite. On the west side the mountain is flanked by precipitous cliffs 500 to 700 feet in height. For a long distance the rocks of the three ages can be distinguished from one another by their colour.

From Inchnadamff a trip was made to Kylesku and Loch Glencoul, where the famous "thrust planes" are to be seen in striking exposures. The character of the thrusts will be gathered from the following:[2] "The most important feature in the geology

[1]Sir A. Geikie, "Geological Sketches."

[2]See "The Geological Structure of the North-West Highlands of Scotland," Memoir of the Geological Survey of Great Britain, for this and following quotations concerning geology in this paper.

of the Northwest Highlands, which renders this region of surpassing interest to the geologist, is the evidence relating to the terrestrial movements that took place in post-Cambrian time. From a detailed examination of the structures in the field and from certain experimental researches . . . it can be seen that under the influence of horizontal compression, or earth-creep, the rocks in that area behaved like brittle rigid bodies, and were folded over each other, snapped across, piled up and driven westward in successive slices. . . . . The most easterly and perhaps the most powerful of these disruptions, to which the name of "Moine Thrust" has been given, differs from all those to the west in two important points. First, the materials overlying that plane comprise the Eastern Schists—the fourth of the great rock groups referred to . . . secondly, in some instances the strata overlying this (thrust) plane have been driven so far west—for ten miles at least in the Durness area—that they rest almost directly on the undisturbed Cambrian rocks. Hence arise those deceptive sections where there seems to be a normal sequence from the fossiliferous Cambrian zones into the Eastern Schists." The "belt of complication" extends for 120 miles from the north coast of Sutherland to the southern promontory of the Isle of Skye. The following map of the area adjacent to Loch Glencoul illustrates the character of the thrust planes. The point separating Loch Glencoul from Loch Glendhu is composed of Lewisian gneiss, the basement rock, overlain by Cambrian strata. Above the Cambrian is a thrust plane, the Glencoul thrust, and overlying this thrust plane the Lewisian gneiss and



(After Geological Survey of Scotland.)

Cambrian strata are repeated. Above the latter strata is another thrust plane, known as the Moine Thrust, and overlying this thrust plane are the Moine, or Eastern, Schists. There are minor thrusts in this section to which we need not refer. The following diagram of the Glencoul section is a slightly modified copy of one in the memoir of the Geological Survey.

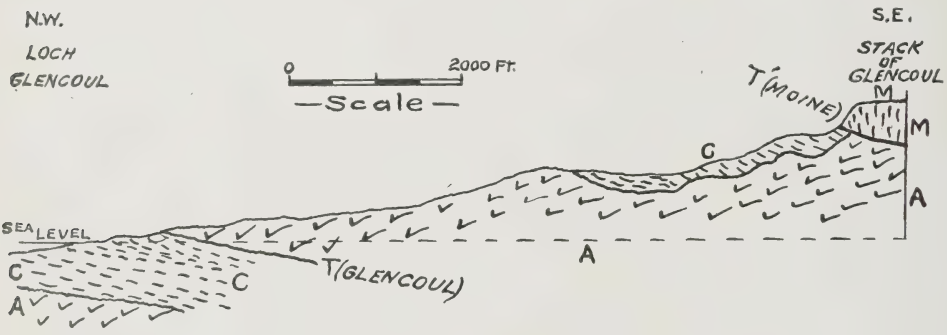
Leaving Inchnadamff, I proceeded southward to Loch Maree, one of the most beautiful lakes in Scotland, in order to examine especially exposures of crystalline limestones with their associated rocks and their relation to the Lewisian. The limestones with their accompanying schists were found to be much like those of the Grenville series of southeastern Ontario.

From Loch Maree I travelled southward to Glenelg, where crystalline limestone and other rocks were examined in Glen Beg.

From Glenelg a steamer was taken to Mallig, thence by railway to Fort William to see the rocks of Ben Nevis. This finished the programme arranged for me and I returned to Edinburgh via Glasgow.

In Scotland, a Canadian is constantly struck with the difference between doing geological work there and in Canada. In the Highlands, on a clear day, the various rock groups on the treeless hills can be recognized from a long way off, while in forest-covered Ontario, for instance, a geologist often cannot see more than a hundred yards ahead, and has to search for outcrops almost yard by yard. Again, in Scotland, even in desolate areas, one frequently has his attention distracted from the rocks to some-

thing of historical or antiquarian interest. For instance, in a lonely glen near Loch Inver a circular opening in the cliffs was pointed out as having been used as a pulpit. "It was grand to hear them singing the Gaelic hymns." On the north side of Loch Assynt are two ruins, in one of which Montrose is said to have been betrayed. Loch Alsh, near Glenelg, was the scene of some of Prince Charlie's exploits, and at the latter place is the ruins of a barracks erected about 1715 to keep the wild Highlanders in subjugation. It is fortunate, probably, that previous to the trip I had time to look up only the geological literature, otherwise I might have had my attention still more distracted from the rocks. Moreover, to discover things for oneself added to the charm of the trip in some ways. Thus, on going to see the limestones in Glen Beg, than which "there are not many Highland glens more attractive," I came unexpectedly on the Pictish towers. It was almost like exploring an undescribed region. "The valley is rendered still more interesting by these remains of Pictish towers which it contains, and which, if not perfect, are still sufficiently entire to explain the structure of these singular buildings. In an antiquarian view they are even more interesting, not only on account of their singularity, antiquity and obscurity, but because they are by much the most perfect, as well as the most accessible, "specimens" of the earliest native architectural remains." Whether these Pictish towers, or burghs, are of Danish or purely native origin, has been disputed. These large circular structures are built of unhewn stone and entirely without cement. Many remains of the towers can still be traced in the Highlands. The masonry is remarkably well laid and the lines of the curvature are beautifully preserved, the form being that of a truncated cone.



Outline of the Geology

In the opening paragraph of the introduction to the great memoir on the "Geological Structure of the North-West Highlands," Dr. John Horne so briefly and interestingly summarizes the present knowledge of the geology and the history of the work of unravelling the relationships of the rocks, that I may be permitted to quote his words: "In the North-West Highlands of Scotland four great rock-groups are remarkably developed, each characterized by a peculiar type of scenery and illustrating in a vivid manner the intimate relation that exists between geological structure and the evolution of mountain-forms. Each group has impressed its own individuality on the landscape in such a manner as to arrest the attention not merely of the geologist, but even of the casual and unscientific traveller. These four groups are in consecutive order from west to east: 1st, the Lewisian or Fundamental Gneiss; 2nd, the Torridon sandstone; 3rd, the Cambrian formation; and, 4th, the Eastern Schists. Ever since the time of Macculloch, at the beginning of the last century, the stratigraphical position and relative age of these rocks have been subjects of animated discussion and, for a time, of keen controversy. Relying on the apparent order of superposition, the earlier observers naturally inferred from the magnificent sections laid bare along the western fjords and on the grand escarpments and dip-slopes of the mountains, that the Eastern Schists follow the Cambrian strata in conformable sequence. But the geological struc-

ture, which seems at first sight so simple, has proved on later detailed examination, to be extremely complicated. The apparent succession has been found to be deceptive, and the superposition, which is undeniable, is now ascertained to be due to great terrestrial displacements, which have no parallel elsewhere in Britain."

Owing to the marked contrast in the lithological character between the three great series of rocks—the grey or pink Fundamental gneiss, the red Torridon sandstone, and the white Cambrian quartzites with the limestones and dolomites—it was possible for the officers of the Geological Survey to trace the several portions of these formations even through extremely complicated structures.

Early Work in Scotland and Canada

Between 1814 and 1824 Macculloch proved the true relationship between the two great series, the Lewisian and the Torridonian. This relationship is like that which exists between the Huronian and the Laurentian of Canada, where work did not begin on the pre-Cambrian till nearly twenty years later. In 1827 Murchison and Sedgwick



Culag Hotel, Loch Inver, with exposure of Lewisian Gneiss.

visited northwest Sutherland. From this time on, during the thirty years or so that Logan and his assistants were working out the structural and age relations of the pre-Cambrian rocks of Canada, the ancient rocks of the Northwest Highlands received much attention, notably from Murchison and J. Nicol. By 1860 the latter had worked out the relationships of the rocks so completely that he is admitted to have "displayed the qualities of a great stratigraphist in grappling with the tectonics of one of the most complicated districts of Europe."

The papers published on the Highland rocks and the controversies concerning them, during the period to which reference has been made, must have been of much interest, and doubtless acted as an inspiration, to Logan and his associates engaged with similar problems.

The Lewisian

The Lewisian or Fundamental Gneiss stretches as an interrupted belt from Cape Wrath to Loch Torridon. Like much of the territory occupied by the Laurentian of Canada, this belt of country is remarkably bare and sterile. Rounded domes and bare ridges, with intervening hollows, follow one another.

The Lewisian system occupies a position in relation to the sandstones and conglomerates of the Torridonian similar to that which the Laurentian and Keewatin do to the fragmental Huronian and Keweenawan series of Canada. In other words, the Torridonian rests on the Lewisian with strong unconformability. Moreover, like the typical Laurentian, the Lewisian rocks are characterized by banded and foliated structures.

The Geological Survey of Scotland has arranged the Lewisian in two groups: (1) a Fundamental Complex, composed mainly of gneisses that have affinities with plutonic rocks, and, to a small extent, of crystalline schists and limestones which are probably of sedimentary origin; (2) a great series of igneous rocks intrusive in the Fundamental Complex in the form of dikes and sills.

Group (1) is very similar to that which was embraced under the name Laurentian by Logan, whose classification has been used up to comparatively recent times in Canada. The gneisses of Scotland correspond to the typical banded gneiss of Logan's Laurentian, while the crystalline limestones can be compared with his Grenville series, which was placed by him in the Laurentian system. During recent years in Canada the name Laurentian has been used in a more restricted sense.

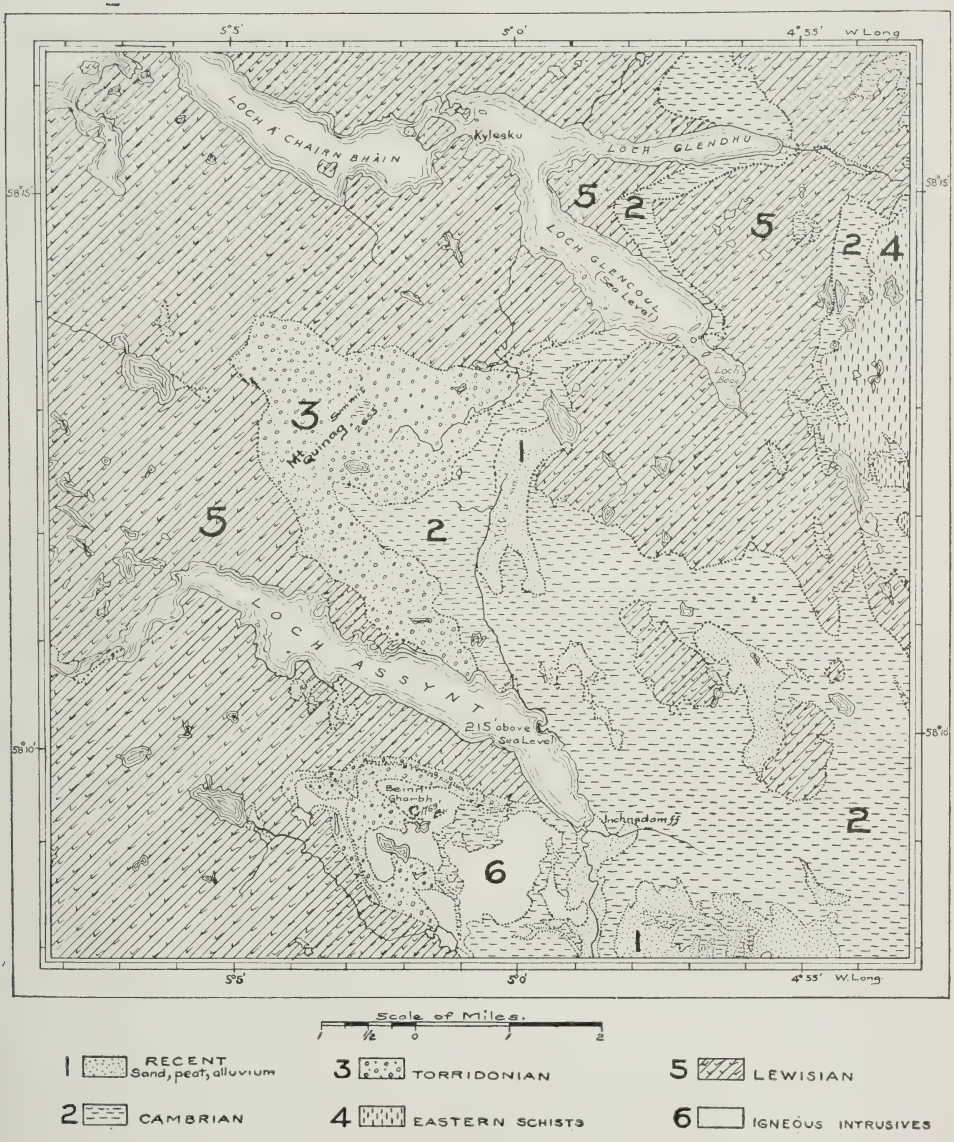
Sediments in Lewisian

In the memoir to which reference has been made, Dr. Horne says: "If the stratigraphical relation of the altered sediments of the Lewisian gneiss to the gneisses that have affinities with the plutonic rocks could be definitely ascertained, it would possess much geological interest, in view of the antiquity of these sediments and the relative ages of the original types of gneiss. There is no clear evidence that these types are intrusive in the former, but, in certain places, the two are so intimately associated as to suggest that the rocks of igneous origin may have been injected into those of sedimentary origin. On the other hand, there is undoubted proof that, north of Loch Maree, the altered sediments rest on a platform of gneiss and are locally overlain by gneiss with basic dikes, the superposition of the gneiss on the sediments being there due to folding and thrusting."

The sediments, consisting of the crystalline limestones and associated rocks, are much like the sediments in the Keewatin-Laurentian complex of southeastern Ontario. Mr. Cyril W. Knight and the writer have expressed the opinion that the older crystalline limestones here represent marine precipitates which have been deposited on the surface of the Keewatin lava flows. Then the rocks having been subjected to stresses, in many localities, a complexity has been produced which is difficult to unravel. In so far as the writer could see, a similar relationship may exist between the crystalline limestones and some of the other Lewisian rocks of Scotland.

The igneous gneisses of the Fundamental Complex of Scotland represent plutonic types, while the Keewatin rocks of Canada, our oldest rocks, are volcanic. This difference may be accounted for by the fact that the period of denudation prior to the deposition of the Torridonian sediments was more prolonged than was the period of denudation in Canada prior to the deposition of the Huronian sediments, which do not seem to be represented in the Northwest Highlands. In this Scottish region the surface igneous rocks have been eroded and the underlying plutonic rocks have been exposed, while in Canada, denudation did not go far enough to remove the surface material, now represented by the Keewatin. "It is remarkable that their (Torridon sandstones) enclosed pebbles include pieces of quartzite, which show contact alteration, spherulitic jaspers that have been formed by the silicification of liparites, and spherulitic felsites which closely resemble those of Uriconian age in Shropshire. As these fragments have all been derived from formations that are now not visible anywhere in the western part of the Counties of Sutherland and Ross, they furnish further evidence of the denudation of the Archean plateau in the pre-Torridonian time."

In other words, the quartzite pebbles show that pre-Torridonian fragmental series, probably to be correlated with the Huronian of Canada, and the liparites and felsites show that a series of volcanic rocks have been removed by denudation, bringing to the



Geological Map of the area in the vicinity of Lochs Assynt and Glencoul, Sutherlandshire. The map shows the areal distribution of the pre-Cambrian (Lewisian and Torridonian) and the Cambrian, together with the two thrust planes at Loch Glencoul. (After coloured map of the Geological Survey of Scotland).

pre-Torridonian surface the plutonic types of the Fundamental gneiss. The felsites and other volcanic types may represent a series comparable in age with the Canadian Keewatin.

Grenville and Keewatin

The following quotations, taken from different pages of the Memoir, will bring out more clearly the resemblance of the sedimentary material in the Lewisian gneiss to the Grenville series of Canada. Moreover, it will be seen that the sedimentary material is associated with hornblende or chlorite schist, some of which may be altered basic lava. Associated with the hornblende schists are "quartz-magnetite granulites resembling the rocks of the Penokee iron-bearing series described by Irving and Van Hise." The hornblende schist, in so far as the writer knows, has not been proved to be intrusive into the crystalline limestone and associated sediments, but it is said that it "appears to have been injected along the margins" of the sedimentary bands. Since the hornblende schist is not known to be intrusive, one might be pardoned for hazarding the opinion that the relationship between at least some of the hornblende or chlorite schist on the one hand, and the crystalline limestone, iron formation and other sedimentary material, on the other, is like that between the Keewatin and the iron formation and other sedimentary material in Ontario and the Lake Superior region in general. In any case it may be said that the Scottish rocks, in character and in their association, are strikingly like those of the last mentioned region.

"In Gairloch the chief belt of these altered sediments extends for seven or eight miles . . . . Its width is about a mile and a quarter, half of which is occupied by bands of hornblende-schist or hornblende chlorite schist. Consisting for the most part of a fine-grained brown mica-schist, it contains also various bands of limestone, graphite-schist and quartz-schist or quartz-magnetite-schist."

"There is no proof of the intrusion of the gneissose rocks of the Fundamental Complex into the supposed sediments, nor yet of the unconformability of the latter on the former. In certain places bands of marble and of kyanite-gneiss lie within gneisses of common type in the complex, and pass gradually into them."

"Great intrusions of igneous material, most of them now in the form of hornblende-schist, appear also to have been injected along the margins." And further: "Their (the hornblende schists) general uniformity of composition and texture and the rarity of inclusions in them which can be regarded as detached fragments of other rocks, or distorted amygdules, are hardly consistent with the supposition that they are altered contemporaneous lavas, but, on the other hand, they have nowhere been observed to transgress the sediments in any clear section. In general they are more finely foliated than most of the dikes either near them or elsewhere."

"On the southeast side of Shieldaig a band of micaceous schist, 120 yards broad at its greatest width, often calcareous and with outcrops of marble, emerges from beneath the Torridon rocks."

"It is interesting to compare the rocks of this and the preceding group (quartz-schists) with certain rocks found in the Penokee iron-bearing series. . . The rocks of this series include (1) cherty carbonates; (2) ferruginous slates and cherts; and (3) actinolitic and magnetitic slates. The quartz-hornblende rocks and the quartz-magnetite rocks from the Loch Maree area have decided affinities with the actinolitic and magnetitic slates of Van Hise. Both groups of rocks contain the same minerals and possess to a certain extent the same structures."

The altered sediments on the northeast side of Loch Maree "are associated with broad outcrops of hornblende-schist, and consist for the most part of mica-schist, graphite-schist and limestone, with bands which may represent altered quartzite and chert. The broadest development of these rocks stretches from Letterewe to Fasagh and may be called the Furnes belt. Its length from northwest to southeast is about five miles, and its greatest breadth, including various outcrops of hornblende-schist, nearly three-quarters of a mile."

"Near Kerrysdale chloritic schists occur on both sides of the more northwesterly of the two hornblende-schists. . . . These schists merge into hornblende-schists. . . . Small crystals of magnetite and calcareous spots and streaks appear more commonly in the chloritic than in the hornblendic schists. The chloritic schists usually effervesce freely with hydrochloric acid, even when no carbonate can be recognized macroscopically, and one of the calcareous streaks near Auchtercairn is a good limestone."

"A quartz-magnetite-schist, mixed with limestone and calcareous chlorite-schist, is seen in various places at the northeast side of the thick hornblende-schist which runs northwest from a point 300 yards southwest of the outlet of Loch Bad an Sgalaig in the Gairloch district.

"The quartz-schists in both districts may possibly represent altered cherts, but the present resemblance of certain portions of them to cherts is perhaps rather the result of deformation. In some exposures northeast of Loch Maree more than 30 thin laminæ may be counted in the thickness of a quarter of an inch. Each of them was not improbably broader originally but has been dragged out and thinned."

It may be that some of the Canadian banded gneisses which have been called Laurentian are in reality older than the Keewatin. If this is the case, then these gneisses represent the surface over which the Keewatin rocks have flowed, and the crystalline limestones and other sediments have been deposited on the surface of the lavas or interbedded with them. If such be the case in Canada and the Lewisian gneiss is not intrusive into the crystalline limestones and schists of the Highlands, then the relationships and resemblance between the oldest rocks of Canada and the Highlands is similar.

On the other hand, if the Lewisian is intrusive into the crystalline limestones and associated schists, the relationship is exactly like, in so far as is known, that which the Laurentian granite and gneiss bears to the Keewatin and Grenville rocks of Canada.

Group (2) of the Lewisian

Group (2), the igneous rocks intrusive into group (1), corresponds in a general way with certain post-Laurentian intrusive rocks of Canada, viz., certain granites and so forth which are pre-Keweenawan in age.

The Torridonian

There is no means of definitely determining whether the Torridonian of Scotland corresponds to the Huronian or to the Keweenawan of Canada. It has been correlated with the Keweenawan by some writers on account of its reddish or brownish colour and degree of consolidation. But rocks that look alike, especially in the pre-Cambrian, are frequently quite different in age. Moreover, in the writer's opinion, much of the Torridonian shows as great a degree of consolidation as does some of the Huronian. In fact, in certain localities, the Torridonian has a schistose structure.

"The great bulk of the formation consists of more or less coarse-grained arenaceous sediments in the form of felspathic grits and sandstones (arkose), with occasional thin intercalations of fine-grained micaceous shale and sandstone. Coarse angular breccia occurs as a local base, and numerous bands of pebbly grit, conglomerate, and scattered pebbles are found at different horizons, while the whole series is characterized by false bedding and other signs of current action." The prevalent features of the series are the uniformity of composition and fresh appearance, and the regularity and generally undisturbed character of their disposition.

"The base of the Torridonian series is usually formed of a conglomerate or breccia, sometimes exceedingly coarse in texture, and derived from the Lewisian rocks in the immediate vicinity."

"The pebbles that occur so abundantly throughout the arkose series afford, however, the strongest proof of the foreign origin of most of the Torridonian sediments. . . . it may be sufficient to state here that they (the pebbles) include examples of sedimentary, metamorphic and igneous rocks which are not found within the Lewisian area, and suggest the existence of a pre-Torridonian sedimentary and eruptive series as the source of the coarser materials of the Torridonian formation."

While the writer does not think that the lithological resemblance of the Torridonian to the Keweenawan is sufficient evidence on which to base the correlation of the one with the other, there is other evidence to the effect that the two series should probably be correlated. (a) On a preceding page it has been shown that certain pebbles, quartzite and so forth, in the Torridon conglomerate, prove that a sedimentary series has been removed before the deposition of the Torridonian. This series that has been eroded may correspond to the Huronian of America. If so, then the Torridonian may be considered to correspond to the youngest of the pre-Cambrian sedimentary series of America, the Keweenawan. (b) The intrusive rocks of group (2) of the Lewisian do not cut the Torridonian. They bear a relationship to the latter like that which certain granites, and so forth, of America, which cut the Huronian, bear to the Keweenawan.

The following table will make clear the suggested relationships:

1. Canada—

A. Keweenawan.

B. Huronian with intrusives.

C. Keewatin-Laurentian Complex (Laurentian granite and gneiss, Keewatin greenstones, etc., together with crystalline limestone, iron formation, etc.)

2. North West Highlands.

A. Torridonian.

B. Intrusives (of group (2) of Lewisian). A fragmental series consisting of quartzite, etc., has been removed by denudation prior to deposition of Torridonian.

C. Lewisian, Fundamental Complex (gneiss, hornblende and chlorite schists, crystalline limestone, iron formation, etc.)

After the eruption of the dikes and sills of group (2) of the Lewisian, and long before the deposition of the Torridonian rocks, the whole region of northwest Scotland was subjected to terrestrial stresses which affected both the Fundamental Complex and the intrusive masses that penetrate it.

Glacial Origin of Conglomerate

It is interesting to note that a glacial origin was suggested formerly for the Torridon conglomerate, as it has been suggested in late years for Huronian conglomerate of Ontario. "The mammilated contour so characteristic of the plateau of Lewisian gneiss was attributed by Sir A. Geikie in 1880 to the action of land-ice, and he compared the overlying breccia of Torridon sandstone age, that fills up the hollows and buries the rounded domes of rock near Gairloch, to moraine stuff."

In the final memoir by the Geological Survey on the Northwest Highlands, 1907, the theory of the glacial origin of the Torridon conglomerate is dropped. "The basal breccias which often flank the buried mountains (Lewisian below Torridonian), are, as already explained, of the nature of scree material. They consist of fragments of the local rocks embedded in a sandstone matrix. The conglomerates, on the other hand, are probably torrential deposits brought down from a district very different in geological structure from that of the area in which Lewisian gneiss occurs."

The fragments of rock in the Torridon conglomerate and breccia have frequently come from a considerable distance. "In one instance, on the north side of Loch Maree, it has been observed that blocks in the conglomerate have come from the hornblende-schist ridge of Ben Lair, and may have travelled a distance of three miles."

Absence of Ore Deposits in Highlands

Considering the importance of the ore deposits in the pre-Cambrian of the Lakes Huron-Superior region, the absence of valuable deposits in the Highlands at first seems remarkable. If we bring to mind, however, the difference between the pre-Cambrian of the two regions, the non-economic importance of the Highland rocks is not so much to be wondered at. The Keewatin series is not known to occur in the Highlands, and, if it does, the outcrops are comparatively insignificant. In this series in America are found the Vermilion and other important iron ranges. The Animikie or Upper Huronian is likewise absent in Scotland, while in the Lake Superior region the great

Mesabi iron deposits occur in it. Moreover, if there are rocks in Scotland similar to the quartz-diabase of Cobalt or the norite of Sudbury, which have been the ore-bearers in these two important mineral areas, they are of small volume. The copper deposits of Michigan are found in the Keweenawan, but the Torridonian has not been rendered of similar economic importance by basic igneous rocks.

Cambrian and Eastern Schists

Little need be said concerning the Cambrian except that it rests unconformably on the Torridonian and its lower beds represent the Olenellus zone. One of the most puzzling points that the early workers in the field had to deal with was the relation of the Cambrian to what are known as the Eastern or Moine Schists, the fourth great group of the Highlands. Later work has shown that the superposition of the highly metamorphosed rocks on the Cambrian has been brought about, as has been said on a preceding page, by thrust.

The character of the Eastern schists and the knowledge possessed of their age relationships will be understood from the following: "Only a brief reference need be made here to the Eastern Schists that appear to the east of the Moine Thrust-plane. Excluding the belt of mylonized rocks (ground-up rocks), usually found in association with that displacement, this group comprises flaggy, quartzose schists with muscovite, quartz-biotite, granulites, and garnetiferous muscovite-biotite-schists, which together evidently represent an altered sedimentary series. . . . These rocks have been the subject of much discussion. They were once regarded as portions of the oldest or Azoic architecture of the country. Murchison considered them to be a metamorphic series of mainly sedimentary formations, later in date than the Lower Silurian (Cambrian) limestones and quartz-rocks which underlie them, and into which they seemed to pass downward in a conformable succession. The detailed study of them by the Geological Survey has thrown considerable light on their composition and structure, but the problem of their age and origin has not yet been completely solved. . . . When the rest of the Highlands lying to the east of that belt has been surveyed, it may be possible to offer some more definite opinion as to the stratigraphical relations and history of these rocks."

While rocks of diverse age and origin are included under the name Moine Schists, "which together evidently represent an altered sedimentary series," a person familiar with the pre-Cambrian of Canada will be inclined to ask himself whether much of this altered sedimentary series does not represent a group of rocks that, in age, lies between the Lewisian and the Torridonian. If this is the age relation of some of the schists, they occupy a place in the geological column similar to that of the Huronian of Canada, which lies between the older Laurentian-Keewatin complex and the younger Keweenawan. In the description, given above, of the Torridonian, it was said that the pebbles of quartzite and other rocks, "derived from formations that are not now visible anywhere in the western part of the counties of Sutherland and Ross," are found in the conglomerates of the series, showing that an older sedimentary series has been removed before the deposition of the Torridonian. Similarly in Canada it is found in some localities that the Huronian has been removed before the deposition of the Keweenawan on the Laurentian-Keewatin complex.

The relationship that has been observed to exist, in two or three localities, between the Lewisian and the Eastern Schists, will be seen from the following: "More recent work, however, between Stromeferry and Loch Alsh has led Dr. Peach to the belief that the Moine Schists in that district rest unconformably on gneisses of Lewisian type. He has found what he regards as a conglomerate locally developed at the base of the Moine Schists and overlain by a definite order of succession among the schists analogous to that in the Diabaig group of the Torridon sandstone. . . . It would thus appear that at least some of these rocks existed as crystalline schists before they had reached their present position." Schists in one locality in Skye possess characteristics from which it might be inferred that they represent a sedimentary series older than the Torridonian. "These schists represent what were originally false-bedded grits and sandy and gritty shales."

THE MINING LAW OF ONTARIO

BY S. PRICE, Mining Commissioner

General Remarks

The mining lands already taken up in Ontario form but a very small fraction of the total area of the Province. Less than one million of our total 126 million acres have been patented and leased for mining purposes, and less than 26 million acres have been alienated by the Crown for all purposes. More than 100 million acres, or over four-fifths of the total area, still remain vested in the Crown and open, with but trifling exceptions, to the prospector and miner.

Laws regarding the disposition of public lands by the government and the exploration and acquisition and use of them by the individual for mining purposes, differ greatly in different countries and have varied much from time to time in our own Province; and probably no law upon the subject anywhere has ever had the unanimous approval of those working under it, for individual opinions and points of view differ even more widely than the laws. Poor prospectors and rich capitalists, men with little and those with large experience, those who want to find something to develop and those who desire merely to get something to sell, the miner who wants to work the land for the valuable mineral he expects it to produce and the speculator who desires only to hold it while neighboring development increases its value, can hardly be expected to view matters in the same light or to desire the same kind of a law; nor is the interest of any of them always identical with the paramount interest of the community as a whole to which the property in the first place belongs; though doubtless in a country with the mineral promise and the large extent of minerally unexplored territory that Ontario possesses, a liberal encouragement of individual enterprise such as will promote discovery and cause development must in the end be the best policy.

The Features of a Good Law

As to what some features of a good mining law should be, there can be little room for controversy. Simplicity in the requirements for the acquisition and holding of claims, and certainty and security in the miner's holding when these requirements have been complied with, may be set down as of first importance. It is also pretty generally agreed that some provision such as working conditions or periodical payments designed to bring about development and prevent the blanketing and holding of lands in idleness or for merely speculative purposes, should form a part of every mining law. Simple machinery for determination of disputes and speedy finality in litigation, are other very important matters from the miner's point of view. Uniformity of laws, which, it has been suggested, might be secured throughout Canada, would also, if it could be accomplished, seem a consummation to be wished, and perhaps not the least of its benefits would be the greater stability which would likely result from it.

Discovery and Title

Among the points upon which laws and opinions differ, two appear most prominent: (1) Whether or not in the taking up of a claim discovery of valuable mineral should be insisted upon, and (2) Whether absolute title in fee simple or only a lease or conditional title or right of occupancy should be given to the claim-holder.

The two points seem to a certain extent correlative—grant of absolute title going more or less logically with the requirement of discovery of valuable mineral, and lease or conditional title or right of occupancy with its non-requirement. Discovery is supposed to show, or to be some indication, that the lands are valuable for mining purposes, and that they will in the natural course be so used, and is therefore some justification for an absolute grant under a statute authorizing the disposal of lands for those purposes. With such a justification lacking, the reasonable thing to do would seem to be to give only such a limited title or right of holding as will ensure or make it likely that

the lands will not be held without being used for the purposes for which they were taken up. The different systems of mining laws have, at all events in general, followed these distinctions. For instance, in the United States, in British Columbia, and for some time past in Ontario, discovery has been required (though not very consistently enforced), and absolute title in fee simple has been given upon completion of a certain amount of development work and payment of what would, if the land were really valuable for mining, be a very insignificant price per acre; while in Nova Scotia, in Mexico, and in Australia, discovery is not exacted, and only leases, titles dependent upon periodical payments, or rights of occupation upon working conditions, are given to the claim-holder. There is, of course, nothing to hinder combination of the requirement of discovery with the limited or conditional character of title (as seems in fact to have been the general rule in miners' customs), or the non-requirement of it with the granting of title in fee simple (as was at one time the case in Ontario), undesirable though the latter may be.

The requirement of discovery would seem to be the ideal principle for disposing of public lands for mining purposes, as under it the law is able appropriately to reward, and as far as possible retain the reward for, the prospector who has conferred a public benefit by bringing to light the hidden resources of the country, and this should encourage prospecting and lead to the opening up of valuable mineral. The great difficulty is to enforce the requirement and to make it operate fairly. It can hardly be denied that, with the exception of a few years during the height of the Cobalt excitement when government inspection was systematically carried out, the law of discovery in Ontario as well as in other places has been a good deal of a failure. The most, perhaps the only, effective method of enforcing it is by having a competent government official make an inspection of each claim. That this was of great benefit in the Cobalt district I think no one acquainted with the circumstances can seriously doubt. To carry it out in less rich and compact mineral regions is a matter of vastly greater difficulty, and perhaps the need is not so great. In response to what appears to have been the desire of the majority of the prospectors and miners of the Province inspection, except in disputed cases, has for the past few years been entirely withdrawn, and the effectiveness of the requirement of discovery has as a consequence been infinitely lessened. Some opinions would abolish the requirement entirely; others would allow claims to be taken up and held on working conditions without it, but would insist upon discovery being made before issue of patent. A requirement so long existing and so widespread, having its origin in the earliest rules and customs of miners themselves, can hardly be without virtue; but the other requirement, as old and probably more general, that a claim-holder must continue to occupy and work his claim or lose his right to it, has perhaps on the whole been the more important and beneficial of the two. The substitution, as in Mexico, of payments of money for performance of work is a variation which finds favor with some who would alter the present system.

History of Ontario Law

Ontario did not, like so large a part of the United States, derive its mining laws from an influx of miners bringing in their rules and customs with them. In our early mining history, going back to about 1845, mining lands were disposed of under Order in Council, at first specific for each case, afterwards crystallized into general regulations. Under these many large areas were granted in fee simple at a small price per acre.

The first legislation, The Gold Mining Act of 1864, (27-28 Vic. Can. Cap. 9) related only to gold mining and did not, as to other minerals, supersede the regulations.

After confederation, The Gold and Silver Mining Act of 1868 (31 Vic. Ont. Cap. 19) was passed by the Ontario Legislature. This followed in the main the provisions of The Gold Mining Act of 1864, but applied to silver as well as gold.

Both these Acts provided for the establishment of mining divisions, and for an officer to preside over them to record claims and determine disputes. The size of claims was very small and varied according to circumstances. A license was necessary, and

the claim had to be staked out by planting a picket at each of the four corners. The title given was merely a right to occupy and work, and leaving the claim unworked for a space of 15 days or more forfeited it.

General Mining Act of 1869

In 1869 was passed The General Mining Act of 1869 (32 Vic., Cap. 34). It superseded the previous Acts and applied to all kinds of minerals. The mining-division provisions were continued with some changes, but with them were enacted provisions for disposing of mining locations of 80, 160 or 320 acres. These might be purchased at $1 an acre, neither discovery nor working conditions being required; nor was it necessary to stake out the land before application.

This Act continued until 1890 with only one change—raising the price per acre in 1886 from $1 to $2. In 1890 (by 53 Vic., Cap. 9) an amendment was made allowing a location of 40 acres as well as one of 80, 160 or 320, and in 1890 also was passed The Mining Operations Act (53 Vic., Cap. 10) enacting rules for safety in the working of mines.

The Amendments of 1891

In 1891 (by 54 Vic., Cap. 8) amendments were made requiring for the first time, so far as statutory enactment was concerned, the performance of development work upon mining locations (as distinguished from mining claims in mining divisions), the work being required to be done during the seven years immediately following the issue of the patent. It was also provided that instead of a patent in fee simple a lease for 10 years might be obtained for a mining location, the lessee to have at any time during the term the right to become purchaser.

In 1892 all former Mining Acts and amendments were repealed and a new Act called The Mines Act, 1892 (55 Vic., Cap. 9), was passed, some new features being added, and the Mining Operations Act of 1890 incorporated.

In 1894 (by 57 Vic., Cap. 16) and 1896 (by 59 Vic., Cap. 13) a number of amendments were made, which are not important for the present purpose.

"Discovery" introduced in 1897

In 1897 (by 60 Vic., Cap. 8) very important changes were again made, and the Acts were consolidated and carried into the Revised Statutes of 1897 (Cap. 36). Discovery of "valuable ore or mineral" was for the first time (by statutory provision) required as the foundation for a mining location, an affidavit of discovery being required to be filed with every application. As to mining claims in mining divisions, the right to take them up was also expressly limited to licensees who "discovered a vein, lode, or other deposit of ore or mineral"; a discovery post was required as well as corner posts, and the form and size of the claim were changed so that instead of being composed of 10 acres laid out along the course of the vein it was to be a square of 22½ acres laid out with boundaries running north and south and east and west, and in filing the claim an outline sketch or plan and particulars much as at present were required.

Again in 1898 (by 61 Vic., Cap. 11), important amendments were made. It was for the first time provided that the holder of a mining claim in a mining division might obtain a patent or lease (at the price per acre charged for mining locations) after performing the prescribed development work for two or three years according as the claim was a square of 22½ acres or a square of 40 acres, the option of making it the latter being now given. The working conditions on mining claims were made five months of one man's time or its equivalent in every calendar year, the old provision requiring continuous working (barring intervals of less than 15 days and any time allowed as close season) being thus replaced.

In 1899, (by 62 Vic. (2), Cap. 10) important amendments were again made, the main feature being a new plan for the taking up of mining land. It was provided that in unsurveyed territory not valuable for pine timber a prospector, after obtaining a license might, under regulations, stake out not more than two mining locations of 40

acres each in a year, and might hold them for two years subject to an expenditure of $3 per acre of actual mining work the first year and $7 per acre the second year, after which he was to complete his application as in the case of ordinary mining locations. This Act also increased the number of years' work required to obtain patents for mining claims from three and two to four and three respectively, and changed the amount of work required on them each year from five months' work to $150 worth of work, computed at $2 per man per day, and provided that when the amount of work required for a patent had been done no further work would be necessary, thus putting them upon somewhat the same basis as to working requirements as mining locations, except that in the case of mining claims the work had to be done before patent and in the case of mining locations after patent.

Again in 1900 (by 63 Vic., Cap. 13), more changes were made. Royalties, before provided for, were declared to be abandoned; provisions were made (to go into force by proclamation, but never enforced) for exaction of what were called license fees on nickel ores exported to be refined outside of Canada; provisions were also enacted for requiring the raising of a specified amount of iron ore on locations and claims shown to be valuable for iron; an appeal (within 20 days) from the decisions of Inspectors of mining divisions to the Commissioner of Crown Lands was provided for; and the rules and provisions respecting the operation of mines were amended and recast.

In 1905 (by 5 Edw. VII., Cap. 9), further amendments were made, the most important being that leases only (and not patents) were to be granted in forest reserves.

Three Methods of Acquiring Land

Pausing to consider the state of the law just prior to the passing of The Mines Act, 1906, it will be observed that three distinct modes of acquiring mining lands were authorized, two of them differing from each other in almost everything required to be done:—

(1) Mining locations of 40, 80, 160, or 320 acres might, in territory outside mining divisions, be applied for on discovery of valuable ore or mineral without previous staking out and without license, and a patent might be obtained at once (a survey being necessary, however, in unsurveyed territory) by paying $2 to $3.50 an acre according to situation, development or mining work of $1 an acre being required in the first two and in each of the next five years (or the equivalent in less time) after the issue of the patent; or, for $1 an acre down and 15 to 30 cents an acre according to situation each subsequent year, a lease subject to the same working conditions might be had, and this might afterwards be converted into a patent.

(2) Mining locations of 40 acres might, in unsurveyed territory (not valuable for pine) outside mining divisions, be staked out, under regulations, by a licensed prospector and held for two years by doing mining work of $3 an acre the first year and $7 the second, after which a patent or lease might be applied for as in the case of other locations.

(3) Mining claims of 22½ or 40 acres might, in mining divisions, be staked out by a holder of a miner's license on discovery of a vein, lode or other deposit of mineral in place and recorded within 30 days after staking, and might be held by the staker or his transferee by doing $150 work each year for four years on a 40-acre claim, or three years on a 22½ acre claim, or the equivalent in less time, after which no further work was required, and a patent or lease at the same rate per acre as in the case of mining locations might be obtained if desired.

The provisions relating to mining divisions, unimportant and pronounced to be a failure though they were for many years, came, in 1897, upon the establishment of the Michipicoten mining division, and again, in 1905, upon the establishment of the Temiskaming mining division (then including the Cobalt district), into very great importance. The power of supplementing the provisions of the Act by Orders in Council was extensively used, and all provisions relating to mining divisions were published in the form of regulations, additions and amendments being made thereto by Order in

Council from time to time, among the most important of which were the provisions added in 1905 for inspection of claims and more effective enforcement of the requirement of discovery. A distinct set of regulations had also been made for the taking up of locations under the plan (the second above described) introduced in 1899.

Up to 1906 all questions and disputes as to claims or interests under the Act or regulations were dealt with in the ordinary course of departmental administration without resort to any special officer or to the Courts.

The Mines Act, 1906

In 1906 all prior Acts and all regulations made under them were repealed, and a new Act, known as The Mines Act, 1906, (6 Edw. VII., Cap 11), was passed. It adopted the principle of one law for the Province, and followed in the main, though with many alterations and additions, the provisions formerly applicable to mining divisions. It provided for the division of the whole Province into mining divisions and the establishment of local recording offices in all important mineral districts, licenses being required and being made good throughout the Province. The requirement of discovery was retained, with a stricter definition and a better system of inspection for enforcing it. The working conditions were altered, especially as to the time for commencing their performance, and the size of claims was made more uniform. The granting of absolute title was continued much as before, the price being made $3 an acre in surveyed and $2.50 in unsurveyed territory, but the granting of leases (except in forest reserves) was dropped, and it was made compulsory to apply for a patent within 3½ years from the date of recording. For the more convenient and speedy determination of disputes and to avoid as far as possible suspicion of political influence in the disposition of claims, the office of Mining Commissioner was established, and an appeal given to the High Court in all important cases. Working permits, giving exclusive rights for limited periods without discovery, were also provided for, but since the withdrawal of inspection these have been little used. The Act also contained provisions dealing with placer mining and quarry claims and with petroleum, gas, coal and salt, and it included, as before, rules and regulations respecting the operation of mines.

In 1907 (by Edw. VII., Cap. 13) extensive amendments were made, having chiefly for their object the better carrying out of the intention of the Act of 1906, and remedying defects which it was found to have. It was made clear, as had been intended in 1906, that a second licensee should not be entitled to stake over a prior claim while the latter subsisted; and, to prevent blanketing as a result of this rule, it was provided that unauthorized staking, and staking without recording, should disqualify the staker, and that disputes might be entered against invalid claims. It was also provided that prospectors, while actively following up indications, might protect their operations by prospecting pickets.

The Mining Act of Ontario

In 1908 a complete revision and consolidation of the Acts of 1906 and 1907 took place (in the course of the work of the Statute Revision Commission), the new Act being called The Mining Act of Ontario (8 Edw. VII., Cap. 21). The provisions were rearranged in simpler and more systematic form and many of them entirely recast. Minor alterations and additions as to procedure and otherwise were made, but there was no change in the general policy of the Act. The most important alteration was the abolition of what was known as the close season (15th November to 15th April), which had formerly been excluded in computing the time allowed for performing the first instalment of work.

In 1909 (by 9 Edw. VII., Cap. 17; and Cap. 26, s. 31), and again in 1910 (by 10 Edw. VII., Cap. 26, s. 35, 45), slight amendments were made; those of 1909 relating chiefly to the operation of mines, and those of 1910 to reports of work and certificates of performance of working conditions.

The Premier of British Columbia is said to have claimed some time ago as the chief virtue of his administration of mining affairs, that he let the law alone long

enough for people to find out what it was. Ontario during the last twenty years can boast little of that virtue. From 1890 to 1900 the changes were frequent and extensive, and many of them fundamental. Since then the one radical change has been that of 1906, but less important ones have been numerous. It is interesting, however, to note that notwithstanding the many changes, much of our earlier legislation has persisted even to the present time. This is perhaps only an illustration that many of the conditions and difficulties with which all mining laws have to deal remain always the same.

The Present Law

The present Ontario law may be briefly outlined as follows:—

(1) Anyone over 18 years of age who takes out a miner's license may prospect for minerals upon Crown lands, or lands of which the mining rights are reserved to the Crown, and may take up, work and acquire title to a specified area by making a discovery of valuable mineral, staking out and recording a claim, performing and filing proof of the prescribed development work, obtaining a survey if in unsurveyed territory, and paying a small price per acre; patent being given in fee simple upon the completion of these requirements.

(2) The claim or any share or interest in it may at any time be sold or transferred to another licensee, and transfers, agreements and other instruments executed by the recorded holder may, and to ensure preservation of priority must, be recorded, the recording office being the repository of title prior to patent, much as the Registry or Land Titles Office is after patent.

(3) The validity of every claim is open to dispute for a limited time after recording, but when this time has passed a certificate of record may be obtained, and on satisfactory proof of performance of work a certificate may also be obtained for that, and these certificates, in the absence of fraud or mistake, are conclusive evidence of the performance of the requirements of the Act.

(4) Questions and disputes arising under the Act, either between individuals or between an individual and the Crown, are adjudicated by the local Recorder or by a special officer called the Mining Commissioner, subject to appeal in important cases to the High Court.

(5) Rules and regulations are prescribed for the operation of mines (whether on patented or unpatented lands) looking to the safety of employees and the protection of the rights of other miners and for the collection of statistics.

All these matters are covered by the Mining Act, and placer mining, quarry claims and operations for petroleum, gas, coal and salt are also provided for. Legislation by Order in Council, as to which so much complaint was at one time made, is not resorted to. There are no rules or regulations, even for procedure, except those contained in the Act; though in the setting apart of mining divisions, and for the withdrawal of lands from sale, and the extension of time for performance of work in specified districts, Orders in Council are still used; and of course in Crown forest reserves the prospector and miner, in common with others, must observe the Forest Reserve Regulations. The comprehensive scope of the Act and its definiteness of detail make it lengthy, but give greater certainty and security to the miner's rights. Allowing prospecting and mining in forest reserves and on lands under timber license and lands of which the surface rights are owned by settlers, which can only be done under provisions necessary to protect the valuable timber and other interests, may cause complication, but it widens the field of the miner's operations.

In the groups of provisions above outlined (omitting No. 5, with which it is not the purpose of the present paper to deal), it will be observed that the first group covers matters which are essentially questions between the applicant and the Crown; the second, matters between individuals, in which the Crown is interested only as it is interested in the general welfare of the mining industry or of the community; while

the third and fourth affect individuals as between themselves as well as individuals in their relation to the Crown. Bearing in mind this dual aspect of the Act will be of assistance in following and applying its provisions.

Each group will be dealt with under appropriate headings.

Requirements for Acquisition of Mining Claims

(a) License.—A miner's license is required for prospecting and for taking up mining claims or acquiring or holding any right or interest therein before patent. It may be obtained at the Bureau of Mines or, except for a company, from any Mining Recorder, and is good throughout the Province. It is not transferable, and it must be renewed on or before 31st March each year. The fee for an individual license is $5 a year; partnership and company licenses are higher and vary according to the number of partners and the capitalization of the company.

(b) Minors.—Any one over 18 years of age may obtain a license and has all the rights and is subject to the same obligations and liabilities as to mining claims and transactions relating thereto as if he were of full age.

(c) Agency.—The requirements for taking up and holding mining claims may be performed by an agent, but for making discovery and staking and recording the agent as well as his principal must have a license.

(d) Lands Open.—All Crown lands and all minerals reserved to the Crown (called mining rights) are open to be prospected and staked out as mining claims if not already taken up, unless expressly excepted, and the exceptions are very limited. Among the lands which are not open at all, or are open only by consent or leave, are lands withdrawn by Order in Council, lands vested in the T. & N. O. Railway Commission, townsites, roads, orchards, gardens, cemeteries, reservoirs, water powers, etc. (secs. 36-43). In Crown forest reserves prospecting must not be done without a forest reserve permit as well as a miner's license, nor work or mining operations without leave of the Minister. Lands under timber license are freely open for prospecting and staking, but work or mining operations must not be carried on upon them without permission of the Minister. Where the mining rights only are in the Crown, the prospector or miner must compensate the owner of the surface rights for any injury done. Particulars as to what lands are open can be had at the recording office, where a map showing all recorded claims is required to be kept for public inspection. Lands already under staking are not open to be prospected or staked out unless the prior staking has lapsed or been abandoned, cancelled or forfeited; but insufficient staking or failure to record within the prescribed time works an abandonment and leaves the lands open, though invalidity of a claim by reason of insufficient discovery does not.

(e) Discovery.—Discovery of valuable mineral is required before a mining claim can be validly staked out. What is to be deemed valuable mineral is defined by the Act. It may be briefly stated as something making it probable that a mine likely to be workable at a profit can be developed from the vein or deposit which is found. A prospector, however, who has found indications may protect his operations on an area 150 by 50 feet by planting prospecting pickets as provided in the Act, and so long as he is diligently and continuously pursuing his search no one else is entitled to make a discovery thereon. There is also the more formal but now little-used procedure of obtaining what is (not very appropriately) called a working permit for cases where discovery cannot readily be made on the surface or without extensive operations. For this, land of the area of a mining claim may be staked out with three rings of notches on the posts, and after 60 days, if no mining claim is staked out thereon within that time, the exclusive right of prospecting and of staking out a mining claim upon it may be obtained for six months, renewable for a further six months, on condition of performing operations to the extent of not less than five days' work each week, or the equivalent in less time, commencing not later than two weeks after the granting of the permit.

Staking out Claims

(f) Claims—size, form, number, etc.—Claims in unsurveyed territory must as nearly as reasonably possible be squares of 40 acres with boundaries running north

and south and east and west, and in surveyed townships must be the aliquot part of a lot or section specified in the Act, but in special mining divisions the area is reduced one half. Not more than three claims can be taken up by a licensee in the same mining division in a license year, but there is no limit to the number that may be acquired by purchase and transfer. The boundaries go down vertically on all sides, and all minerals within them are included in the claim.

(g) Staking.—Staking must be done promptly after discovery, otherwise the discoverer risks the loss of his rights by another discoverer intervening and completing staking before him. The method of staking is very clearly set forth in the Act (sec 54). Posts (of the size and character long used in British Columbia) must be placed at the discovery and at each corner of the claim, and the boundary lines must be plainly blazed and cut out, or, if there are no trees, marked by pickets or mounds, and a line must be marked from the discovery post to the northeast corner, and the posts must be marked with the staker's name and other particulars as specified in the Act. Requiring the planting of posts at the corners and the marking of the boundaries is the plan in use in Ontario since the earliest enactments. Trifling defects will not, but failure to comply substantially with the requirements of the Act as nearly as the circumstances reasonably permit will, invalidate a staking. Unauthorized staking or staking without recording disqualifies the staker from again staking out the same land or any part of it unless relieved against (sec. 57).

(h) Recording.—An outline sketch or plan of the claim must be made showing its form and measurements and the situation of the discovery post, and an application and affidavit in the form provided in the Act giving particulars of the boundaries and location of the claim and proving discovery and the date of staking, and showing that the lands appeared at the time to be open for staking, must be made out and sworn, and filed with the Recorder within 15 days after the staking, or where the claim is more than 10 miles in a straight line from the recording office within 15 days, and one additional day for each additional 10 miles or fraction thereof. The fee for recording is $10. If because of there being a claim already on record, or for any other reason, the Recorder refuses to record the application, the applicant may nevertheless have it put on file, where it will remain pending determination of the questions in dispute, but such a filing does not operate as a dispute of the recorded claim and cannot be dealt with as such unless the applicant files a dispute verified by affidavit as provided in the Act.

The Working Conditions

(i) Working Conditions.—Thirty days' work of 8 hours each, consisting of stripping, opening up mines, sinking shafts or other actual mining operations, must be performed on the claim within three months after recording, 60 days during each of the next two years and 90 days during the third year, and a report duly verified by affidavit giving particulars as specified in the Act, must be filed with the Recorder not later than 10 days after the expiration of each period; but the work may be done and the report filed at any earlier time if desired. The holder of two or three contiguous claims may by first filing notice do the work on one or on two for all. Where the land is under timber license, the time does not begin to run until the Minister has directed that the work may proceed; in Crown forest reserves the time begins to run at once, but any time elapsing between application to the Minister for permission to work and the granting of such permission is excluded from the computation; and in all cases any time specifically excepted by Order in Council or time during which mining operations are prohibited by the Minister is excluded. Failure to perform the work or failure to file proof within the time specified forfeits the claim and leaves the land open to other prospectors; but in cases of death, illness, pending proceedings or other unavoidable cause, or of hardship, and where the default is merely in making the report, limited powers of relief are provided for by secs. 80, 85, 86 and 88.

(j) Survey.—A survey of a claim by an Ontario Land Surveyor is required in all unsurveyed territory, and if the Minister deems it necessary he may direct it in other cases.

(k) Patent.—As soon as the other requirements have been complied with application may be made for a patent of the claim (or if it is in a Crown forest reserve, for a lease), and the application must be made not later than three and a half years after recording, the price to be paid for the patent being $3 an acre in surveyed and $2.50 in unsurveyed territory. The patent is granted in fee simple for surface rights as well as minerals, except where the mining rights only are in the Crown, in which case only half the above price is charged, and the miner must compensate the surface owner for any injury or damage, but pine timber is in all cases reserved, and in the northern parts of the province there is also a reservation of 5 per cent. of the area for roads. In Crown forest reserves renewable 10-year leases are granted instead of patents.

Dealings Between Individuals

(a) Transfer. The holder of an unpatented claim may at any time transfer it or any share or interest in it to another licensee, and the latter may work it and complete the requirements and obtain patent.

(b) Agreements for Interests.—To establish ownership or interest in a claim recorded in the name of another licensee, either writing or material corroboration must be had and is sufficient for agreements made before the staking out of the claim; writing (as under the Statute of Frauds) is necessary for agreements made after the staking out.

(c) Recording Transfers and Agreements.—All transfers and agreements affecting a claim may, if executed by the recorded holder or by his attorney appointed by recorded instrument, be recorded upon the claim in the recording office if the signature is verified by an affidavit of execution made by a subscribing witness. Recording is necessary to ensure preservation of priority.

(d) Title.—What may be designated as a record of title to unpatented mining claims is thus kept at the recording office, and a purchaser desiring information should seek it there and may rely upon what he finds much in the same way as he would upon a search at a Registry office. After patent the title goes to the Registry or Land Titles office, as the case may be.

(e) Delinquent Co-holders.—Where an unpatented claim is held by two or more licensees and one of them fails to perform his share of the working conditions, an order may be obtained from the Commissioner vesting his interest in the other holders; and where the interest of a joint holder has ceased by lapse of his license the Minister may direct that it shall vest in the other holders.

(f) Transmission on Death.—On the decease of the holder the Commissioner may within a year direct that the claim shall be vested in the representatives entitled, notwithstanding any lapse or forfeiture that might otherwise have occurred.

Disputability and Indisputability of Claims

(a) Disputes against Claims.—Any licensee, whether he sets up an adverse right or not, may dispute the validity of a mining claim at any time before a certificate of record is granted, provided he specifies the grounds of invalidity and verifies them by affidavit in the form prescribed by the Act and pays a fee of $10; but by amendment of 1910 leave is necessary after the validity of the claim has once been adjudicated upon or after it has been on record 60 days and has already had a dispute entered against it. This amendment was designed to prevent the harassing of the holder by successive disputes which might prevent the issue of a certificate of record.

(b) Certificate of Record.—After a claim has been on record for 60 days the holder may, if there is no dispute standing against the claim, and nothing making it improper to issue it, obtain from the Recorder what is called a certficate of record, which is final and conclusive evidence of the performance of all the requirements of the Act except working conditions up to the date of the certificate, but may, on application of the Crown or of anyone interested, be set aside by the Commissioner for fraud or mistake.

(c) Certificate of Performance of Work.—This may be obtained if the Recorder is satisfied that the work has been duly performed, and is as to conclusiveness and as to setting it aside on the same footing as a certificate of record.

Adjudication of Disputes

(a) Forum.—Generally, all questions and disputes arising before patent as to the validity or subsistence of an unpatented mining claim, or as to its transfer or ownership or as to any other right or privilege or interest conferred by the Act, are decided by the Commissioner or Recorder, subject to appeal as hereinafter mentioned. In practice matters of difficulty or involving much taking of evidence are usually dealt with by the Commissioner, a transfer being made by the Recorder when necessary.

(b) Appeal from Recorder.—An appeal lies to the Commissioner from every decision and every act or thing done or refused or neglected to be done by the Recorder, but unless appeal is lodged within the time provided by the Act the Recorder's decision is final and binding.

(c) Hearings.—The procedure is simple and speedy. Matters are brought to a hearing by obtaining and serving an appointment with notice of the nature and grounds of the claim or dispute, service of the appointment alone being sufficient where the party to be served has already received a copy of the dispute or appeal. Hearings must ordinarily be in the local district. Proceedings are not invalidated by defects where justice has been done.

(d) Decisions.—All decisions must be entered in writing, and the parties affected must be notified of them by registered letter mailed not later than the day after entry.

(e) Appeal from Commissioner.—With a few exceptions specified in the Act, an appeal lies to an appellate division of the High Court from every decision of the Commissioner, but unless taken within the prescribed time the Commissioner's decision is final and conclusive.

Concluding Remarks

Most of the main features of the Act are in accordance with the resolutions of the Miners' Convention held in Toronto in December, 1905. Perhaps the greatest difficulty in satisfactorily working out the present law comes from the attempt to incorporate in it the various recommendations, often in their nature incompatible, made by the different miners' meetings, and in particular from retaining on the one hand the requirement of discovery, as desired by those who favor that principle, while relinquishing on the other, at the request of those who in practice if not in theory oppose it, the two most effective means of enforcing it, namely, inspection and allowing re-staking of claims without hindrance or delay where the existing staking is not based upon valid discovery. Some other things also, no doubt, could be made better, but in considering alterations the balance must always be struck between the benefit to be derived from them, and the injury inevitably resulting from the unsettling and uncertainty consequent upon frequent change; and the present Ontario Act upon the whole has much to commend it. Its provisions are liberal and calculated to secure fairness and honesty of administration; prospectors and miners are given very wide privileges; mining lands can be quickly acquired, and the expense, apart from development, is slight; rights are clearly defined and title is secure when the law has been complied with; disputes and litigation can be speedily disposed of; the provisions with which the prospector and miner ordinarily have to do are plainly stated; the Act, if long, is very complete; there are no supplementary regulations, and resort to other sources for the law or for information is reduced to a minimum.

THE LAURENTIAN SYSTEM

By WILLET G. MILLER and CYRIL W. KNIGHT

In the early years of the Canadian Geological Survey the pre-Cambrian rocks of Canada were divided into two great groups. The older of these, to which the name Laurentian was given, consists of (1) a great expanse of characteristically banded gneiss or gneissoid granite, called by the early writers Ottawa gneiss,[1] together with (2) sedimentary material consisting essentially of crystalline limestone and gneiss, to which the name Grenville was applied, and (3) a series of rocks of basic composition which was known as the Norian or Upper Laurentian.

The younger group, the Huronian, as then defined, consisted of fragmental rocks of various kinds, but essentially conglomerates and quartzites, derived from the Laurentian by erosion. Certain greenstones in the area first studied on the north shore of Lake Huron were also included in the Huronian. Later work showed that these greenstones should not be placed in this group, and that they are the oldest rocks of the pre-Cambrian. The name Keewatin was applied to them.[2]

When the Keewatin was separated from the Huronian and placed at the bottom of the geological column, the place the Laurentian had formerly occupied, owing to this series being considered the basement series or the oldest of the pre-Cambrian, it became necessary to reclassify or rearrange the table for the pre-Huronian. The classification adopted was:

Pre-Huronian

LAURENTIAN, GNEISS AND GRANITE.

(Igneous contact.)

KEEWATIN.

The name Laurentian was adopted by the Committee[2] for the banded gneisses, or granite gneisses and granites that are intrusive into the Keewatin but presumably not into the Huronian. No distinction as regards age was made between the gneisses and granites. The name Keewatin was applied to the most ancient series of the pre-Cambrian, which consists of greenstones, green schists and other more or less highly metamorphosed rocks, essentially of volcanic type, together with certain sedimentary material represented chiefly by the so-called iron formation, or interbanded silicious material and iron ore, known as jaspylite.

When this classification was adopted the old name Ottawa gneiss was discarded. Moreover, little consideration was given to the Grenville series of southeastern Ontario, as it was felt at the time that the relation of this series neither to the Huronian nor to the Keewatin or Laurentian was understood.[3]

Thus in the course of time the name Laurentian has come to be used in a much more restricted sense than formerly. Instead of embracing both the Ottawa gneiss or granite, the Grenville series and the Norian, it is employed for gneiss and granite that are of pre-Huronian age, or presumably so.

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[1] This gneiss was also known as Fundamental or Trembling Mountain gneiss.

[2] Report of the Special (International) Committee on the Lake Superior Region. Journal of Geology, February-March, 1905. Reprinted in Bur. Mines, Ont., Vol. XIV., and in Sum. Report, Geol. Sur., Canada, 1904, XVIII.

[3] See the Grenville-Hastings Unconformity, pages 221-3, Vol. XVI., Ont. Bur. Mines.

The present authors, however, have felt that the age relationships of the Keewatin, banded gneiss or gneissoid granite, and granites, were not properly understood. Their work, especially in the Cobalt area in the district of Nipissing, had made them acquainted with the fact that there was massive granite older than the conglomerates and other fragmental rocks of the Huronian series in which so many of the cobalt-silver veins are found, as this Cobalt series rests on the eroded, frequently decayed surface of the granite, as well as on that of the Keewatin. While, however, numerous unconformities were known between these rocks, the Cobalt series had not been seen in contact with the typical banded gneiss. Neither had the banded gneiss, which occurs in great volume in the district of Nipissing, been observed in contact with the Keewatin. The age relation between the Keewatin and the banded gneiss, and between the latter and the oldest massive granite, it was thought might be one of two or three kinds, *e.g.*, (1) the banded gneiss might be pre-Keewatin in age; (2) the Keewatin might be older than the banded gneiss; (3) if the Keewatin were older than the banded gneiss, the oldest massive granite might be (4) intrusive into the gneiss, or (5) it might be of the same age as the gneiss. In the last case the difference in character between the granite and banded gneiss might be due to difference in degree of erosion. Since fragmental Huronian rocks were found in contact with the granite and not with the gneiss, it was thought that there might have been more erosion on the gneiss resulting in the removal of the Huronian and the granite facies.

Granite and Banded Gneiss

During the month of May, 1911, we examined the rocks between North Bay and Temagami along the line of the Temiskaming and Northern Ontario railway. From North Bay to Doherty, eight miles south of Temagami, no distinctly clastic rocks were seen. In the vicinity of Doherty, however, a fragmental series similar to that which is of so great economic importance at Cobalt is exposed. The series rests on the eroded surface of a granite somewhat coarse in grain and gray in color. On the railway not far south of Doherty the fragmental series is seen in contact with the gray granite close to the banded gneiss; while to the north it is in contact with the granite and with a basic igneous member of the Keewatin.

The gray granite is cut by two series of acid rocks, both of which are usually finer in grain than the granite itself.

While we do not feel that we have definitely determined the relation of the gray granite to the banded gneiss, still our observations to the south of Doherty led us to believe that this granite graded into the banded gneiss which is also cut by acid intrusions similar to those in the granite. The gneiss appears to be a composite rock, the dark bands representing for the most part portions of the Keewatin included in the intrusive gray granite. Pressure has drawn out the inclusions and produced the banded structure.

Where the granite is in immediate contact with large outcrops of Keewatin, it contains blocks of the latter of considerable size. Proceeding away from the contact the inclusions become smaller in size, and finally the typically banded gneiss appears.[4]

It has been assumed by the International Committee of 1904 and by practically all workers in the Canadian pre-Cambrian in recent years, that the banded gneiss is pre-Huronian in age. In so far as the present writers know, there is little evidence to support this assumption. While undoubtedly certain conglomeratic and other rocks, classed as Huronian, are younger than certain granites, classed as Laurentian, the older Huronian fragmental rocks have not been found in contact with the gneiss. The conglomerate at Doherty, that of the ore-bearing series at Cobalt, that in the county of

[4] There is a good geological map of the area in the vicinity of Temagami and Doherty, by Drs. Barlow and Young, published by the Geological Survey of Canada. Map No. 944.

Addington in southeastern Ontario discovered by us a year ago, and that of the Shoal lake area in the Rainy River district, are all younger than certain granites on which they rest or in the vicinity of which their outcrops are found. But there is reason to believe that in all the areas just mentioned, there may be conglomerates that are older than the granites. At Sudbury, for instance, the only granites known cut conglomerates and other Huronian rocks.[5] Moreover, it has been believed that in the vicinity of Cobalt there is a series of fragmental rocks older than the typical conglomerates and slate-like greywackés. In the first edition of the report on Cobalt the senior author said: "The pre-Cambrian has been separated into the following series by the writer. It is possible, however, that unconformities exist which have not been located as yet." (p. 33.) In the marginal notes of the first edition of the Cobalt map it is said: "The terms Lower and Middle Huronian are here used provisionally. The formations have not been correlated with those to which the names are applied in the vicinity of the north shore of Lake Huron and elsewhere." A few boulders of what appeared to be conglomerate were found in the conglomerate of the Cobalt series, thus raising the suspicion that there is an older fragmental series in the region. Some of the conglomerates on Lake Temiskaming and some of those on Rabbit lake and elsewhere, judging from the steep dips and disturbed condition generally, probably represent an older series.

It would thus seem that there is little justification for assuming that the banded gneiss of the Laurentian is older than all of the Huronian series. It may be long before the true relationship is determined, since in all the areas mapped the more massive granite facies of the gneiss have been found in contact with the Huronian or with the Keewatin. It would seem from this that the banded facies may represent a deeper seated zone, which is exposed only on the erosion not only of the older fragmental rocks but of the massive granite and Keewatin. Where the two last mentioned series are in contact, the banded structure has not been observed. Probably large masses of Keewatin have tended to prevent the formation of the banded or gneissoid structure in the intrusive, as they would withstand pressure better than a molten or semi-molten magma. In the Lakes Superior-Huron region granites of various ages are known. Even the youngest rocks of the pre-Cambrian are intruded by granite.[6]

Most workers in the pre-Cambrian field will, it is believed, agree with the authors, that much remains to be learned concerning the age relationships especially of the so called Laurentian and the Huronian.

The following notes from the writings of Logan and the two Dawsons are of interest as showing the views held concerning the Laurentian in the past.

Logan's Pre-Cambrian Classification

Logan's early views on the dual subdivisions of the pre-Cambrian, or as he called them, "the Subsilurian Azoic rocks," will be seen from the following:[7]

So early as the year 1845, as will be found by reference to my report on the Ottawa district presented to the Canadian Government the subsequent year, a division was drawn between that portion which consists of gneiss and its subordinate masses, and that portion consisting of gneiss interstratified with important bands of crystalline limestone. I was then disposed to place the lime-bearing series above the uncalcareous, and although no reason has since been found to contradict this arrangement, nothing has been discovered especially to confirm it; and the complications which subsequent experience has shown to exist in the folds of the whole—apparent dips being from frequent overturns of little value—would induce me to suspend any very positive assertion in respect to their relative superposition, until more extended examination has furnished better evidence.

In the same report is mentioned, among Azoic rocks, a formation occurring on Lake Temiskaming, and consisting of silicious slates and slate conglomerates, overlaid by pale seagreen or slightly greenish-white sandstone, with quartzose conglomerates.

[5] A. E. Barlow, Geol. Sur. Can., Pt. H, XIV.. and A. P. Coleman, Pt. III., Vol. XIV., Ont. Bur. Mines.

[6] See page 94, Report of Special Committee cited above.

[7] Am. Ass. Ad. Sci., 1857. *The Can. Journal*, Vol. II., pp. 439-442. *Can. Naturalist*, 1857, p. 255.

In the report transmitted to the Canadian Government in 1848, on the north shore of Lake Huron, similar rocks are described as constituting the group which is rendered of such economic importance from its association with copper lodes. The group consists of the same silicious slates and slate conglomerates, holding pebbles of syenite instead of gneiss; similar sandstones sometimes showing ripple-marks, some of the sandstones pale seagreen; and similar quartzose conglomerates, in which blood-red jasper pebbles become largely mingled with those of white quartz, and in the great mountain masses predominate over them. But the series is here much intersected and interstratified with greenstone trap, which was not observed on Lake Temiskaming.

The group on Lake Huron we have computed to be about 10,000 feet thick, and, from its volume, its distinct lithological character, its clearly marked date posterior to the gneiss, and its economic importance as a copper-bearing formation, it appears to me to require a distinct appellation, and a separate color on the map. Indeed, the investigation of Canadian geology could not be conveniently carried on without it. We have, in consequence, given to the series the title of Huronian.

A distinctive name being given to this portion of the Azoic rocks renders it necessary to apply one to the remaining portion. The only local one that would be appropriate in Canada is that derived from the Laurentide range of mountains, which are composed of it, from Lake Huron to Labrador. We have therefore designated it as the Laurentian series.

These local names are, of course, only provisional, derived for the purpose of avoiding periphrastic or descriptive titles the use of which had been found inconvenient, and they can be changed when more important developments, proved to be the equivalents of the series, are met with elsewhere.

J. W. Dawson's Classification, 1889

Over thirty years later practically the same classification as that introduced by Logan was employed in Canada. Thus Sir J. W. Dawson subdivided the Laurentian as follows:[8]

LAURENTIAN
3. Upper Laurentian (Norian of Hunt). Labradorite and Anorthosite series of the Ottawa district, etc.
2. Middle Laurentian, or Grenville Series. Gneiss, diorite, limestone, pyroxene rock, etc.; being the upper part of the Lower Laurentian of Logan.
1. Lower Laurentian or Ottawa Series. Orthoclase gneiss of Trembling Mountain (Logan), Ottawa gneiss (Geol. Survey), Lower part of Lower Laurentian (Logan).

G. M. Dawson's Classification, 1897

About ten years later Dr. G. M. Dawson, then Director of the Geological Survey of Canada, gave a somewhat similar definition of the Laurentian[9] in the following words:

We may ask what is now our conception of these Archæan (pre-Cambrian) rocks in Canada, and more particularly in the great Protaxis, as resulting from the most recent investigations of a critical kind. The reply may be given briefly from the latest reports of those still at work on the problems involved as follows: 'The Laurentian comprises (1) The Fundamental Gneiss or Lower Laurentian (also referred to as the Ottawa Gneiss or Trembling Mountain Gneiss in older reports), and (2) the Grenville Series. . . . . The Upper Laurentian, Labradorian, Norian or Anorthosite group, maintained for a number of years on the evidence already mentioned, is found to consist essentially of intrusive rocks, often foliated by pressure, later in age than the Grenville series, but in all probability pre-Paleozoic.'

Reverting to the original classification of the Archæan of the Canadian Survey, as developed in the field by Logan and his assistants, we may now inquire—In how far does this agree with the results of later work above outlined? In the main, this classification still stands substantially unaltered, as the result of all honest work carefully and skillfully executed must. The nomenclature adopted is still applicable, although some of our conceptions in regard to the rocks included under it have necessarily undergone more or less change.

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[8] Handbook of Canadian Geology, 1889, pp. 57-58.
[9] Presidential address, section C., Brit. Ass. Ad. Sci., 1897, p. 634.

The Laurentian is still appropriately made to include both the Fundamental Gneiss and the Grenville series; although at first both were supposed to represent 'metamorphic' rocks, it was even then admitted (1855) that these embraced some plutonic masses practically inseparable from them. Later investigations have increased the importance of such plutonic constituents, while, at the same time, demonstrating the originally supposed sedimentary origin of the characteristic Grenville series, but the admission of so large a plutonic factor necessarily invalidates in great measure the estimates of thickness based upon the older reasoning, under which any parallelism of structure was accepted as evidence of original bedding.

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Government Road, near Frederick House Lake.

TWENTIETH ANNUAL REPORT

OF THE

BUREAU OF MINES, 1911

VOL. XX., PART II.

THE PORCUPINE GOLD AREA

BY A. G. BURROWS

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Map of the Porcupine Gold Area, scale 1 mile to 1 inch.
Map of area between Gowganda and Porcupine, scale 2 miles to 1 inch.

REPORT OF THE BUREAU OF MINES 1911

VOL. XX PART II

THE PORCUPINE GOLD AREA

BY A. G. BURROWS

Situation

The Porcupine gold area, which for the past two years has held the attention of the mining public, is situated on the Hudson Bay slope of northern Ontario. The latitude of Niven's First Base Line of 1899, which runs through the centre, forming the south boundary of Tisdale and Whitney, is 48° 27′ 54″; consequently the area is somewhat farther south than the Canada-United States boundary in Manitoba and other western provinces. The main part of the camp is in the Sudbury judicial district, about six miles from its eastern boundary. Lying along the southern fringe of the great clay belt of northern Ontario, it adjoins a prospective farming country. In this belt many townships have been laid out in six or nine-mile squares and subdivided into mile blocks; in the gold area itself and in the adjoining country to the north, many quarter sections (160 acres) have been granted to veterans as homesteads. Up to the present time prospecting and underground development have shown that Tisdale is by far the most important township, while promising discoveries have been made in other townships in the vicinity, including Whitney, Ogden, Shaw, Deloro and Langmuir. Immediately to the west and north of Tisdale the country is deeply covered with drift.

To the south and southeast of Tisdale a number of townships have been outlined in six-mile blocks during the past year, and these boundary lines furnish good ties for prospectors who are examining the outlying areas.

A geologically colored map, scale one mile to one inch, accompanies this report.

Ingress to the Area

During the past winter a great quantity of supplies, building material, mining machinery, etc., was taken into Porcupine by way of Kelso, which, at the present time, is the nearest railway station. Kelso, by rail, is 449 miles north of Toronto, and Porcupine lake lies 24 miles to the southwest. The winter season affords a favourable time for moving supplies into the country, since roads which are impassable in the summer are excellent in the winter when used for sleighs. The transportation of supplies during the open part of 1910 was exceedingly difficult, owing to the lack of suitable roads from Kelso to Frederick House lake, and from Hill's Landing on the Porcupine river to Porcupine lake. Most of the supplies were taken in by wagon from Kelso to the southwest end of Frederick House lake, and there transferred to gasoline launches and "pointers" and transported by way of Frederick House river, Night Hawk lake and Porcupine river to Porcupine lake, a total distance of 52 miles.

Porcupine river was much improved for navigation by the construction, by private parties, of three locks and a dam. Practically all the low-lying roads have to be filled in with corduroy or stone to make them suitable for hauling supplies.

Porcupine lake, from which the camp derives its name, is the distributing point for the mineral area. Seven townsites have been laid out adjacent to the lake, and many buildings, including hotels, stores, banks, etc., have been erected.

At the present time the Ontario Government is constructing a branch line of the Temiskaming and Northern Ontario railway from a point two miles north of Kelso to the centre of the area, a distance of about 28 miles. The railroad will run down the eastern side of Porcupine lake.



At first rapids above Hill's landing, Porcupine river.

Topography

In elevation the area averages about 1,000 feet above mean sea level. In this respect it is similar to the Cobalt area, which lies 100 miles to the southeast, south of the height of land. The divide between the Hudson Bay and the St. Lawrence waters is not pronounced, being only about 1,300 feet above sea level.

The country from Night Hawk lake to the Mattagami river is one of low relief. Occasional ranges of hills reach an elevation of 150 feet, but generally abrupt changes in elevation are less than 50 feet. Often in a low area rocks outcrop only a few feet above the surrounding drift and are only a fraction of an acre in extent. Northwest, southwest and southeast of Porcupine lake the country is somewhat elevated, and rock exposures are more frequent than in most of the area.

Superficial Deposits

The area is for a considerable part drift-covered. These drift deposits consist largely of stratified clays, sands and gravels of post-glacial age; and in addition there are patches of moraine material. Sections of stratified clay, overlain by sand, are well exposed on the Mattagami river, north of Pigeon rapids, and along the shores of Night Hawk lake. Most of the islands in this lake have a rocky shore line, but are capped by stratified material. Where the soil has been removed the rocks are seen to have been intensely glaciated. The fine-grained greenstones have well preserved the scratches and grooves produced by glaciation. On several islands were noted two sets of striations, S. 15° W. mag, and S. mag, the latter of which represents the later ice movement. Owing to the lack of drainage, much of the country, though higher than the rivers and lakes, is very wet, but would be suitable for agricultural purposes if properly drained.



Glaciated surface, Night Hawk lake.

Over most of the area there is a dense growth of timber, including black and white spruce, jack pine, poplar, balsam and birch. During last season much of the timber on the higher ridges was burned by forest fires. In this district, however, the forest fires are not wide spread, since there are numerous spruce flats and swamps where fire makes little headway. A growth of young tamarac is replacing the larger tamaracs which have all been killed in recent years by the larch saw-fly. For a description of the agricultural possibilities of the country the reader is referred to reports by Mr. A. Henderson.[1]

[1] Agricultural Resources of Abitibi, Bur. Min., Vol. XIV. (1905); Agricultural Resources of Mattagami, Bur. Min., Vol. XV. (1906).

[2] Bur. Min., Vol. VI. (1896).

Early Examination of Area

Previous to three years ago the area was little known. There were practically no reports upon it except from explorers and geologists who were attached to survey parties sent out by the Ontario Department of Lands, Forests and Mines.

The main part of the camp is situated along an old portage route, from the Mattagami river to Night Hawk lake, which had been used by the Hudson Bay Company officials for a couple of centuries.

In 1896 Mr. E. M. Burwash examined the country along the Algoma-Nipissing boundary line which was run as far as the southeast corner of Whitney township in that year. He noted the occurrence of quartz veins, carrying traces of gold, at various points on the line. One of these veins he found on what is now the east boundary of Shaw, and only a few miles southeast of the main area. He remarked that the country was a promising one for the prospector but for the drift.[2]



Townsite at northwest corner of Porcupine lake. Nov., 1910.

Following the classification of the pre-Cambrian in use at that time Mr. Burwash grouped the Keewatin with the Huronian. He says:—

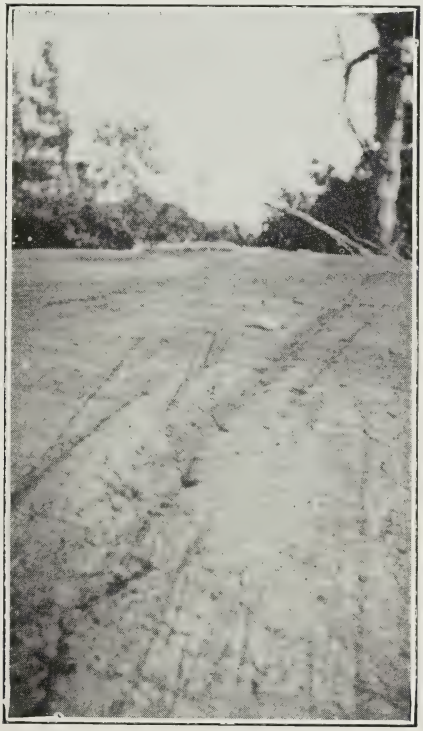
"In the lower part of the series [now considered to be mainly Keewatin] gold appears to be quite widely distributed both in veins which are of tolerably frequent occurrence and in mineralized portions of the rock itself. In two cases the veins were situated near the boundary of granite areas."

In 1899 Mr. W. A. Parks reported on the geology of the portage route from the Mattagami river to Night Hawk lake by way of Porcupine lake. He, like Burwash, noted the occurrence of gold in some quartz veins, particularly in the southwest portion

of Whitney township, obtaining assays from a trace to $1.00 per ton. In his summary Mr. Parks remarked: "I regard the region south of the trail to Porcupine lake as giving promise of reward to the prospector."[3]

Geological descriptions of areas, including and adjacent to the Porcupine area, are to be found in the reports of the Bureau of Mines for 1903, 1904 and 1905 by Messrs. Kay, McMillan and Kerr, respectively.

In October, 1909, Mr. Jas. Bartlett made a brief examination, for the Bureau of Mines, of the early discoveries of the area.[4]



Glaciated surface. Night Hawk lake.

Early Prospecting

In 1906 some work was done by prospectors on a vein near Miller lake and a few hundred feet from the present Hollinger vein. Evidently seeing no free gold, and having no assays made, they abandoned the property. In the same year claims were staked in Shaw township on what is described in the application as a vein of sugar quartz and hematite iron. This is of interest since the so-called vein is simply the upturned edges of the Keewatin iron-formation.

In 1908 claims were staked by Mr. A. G. Hunter on the east shore of Porcupine lake in Keewatin formation. Native gold was found sprinkled through quartz and schist in a sheared zone.

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[3] Bur. Min., Vol. IX. (1900), Niven's Base Line.

[4] Bur. Min., Vol. XIX. (1910).

It was not, however, until the following year that the spectacular discoveries of J. S. Wilson, on what is now the Dome property, caused a rush to the district, and in a few weeks practically all of Tisdale and a great part of the adjoining townships and unsurveyed territory were staked out in mining claims.

Geology

The compact rocks of the area may all be referred to the pre-Cambrian.

Pleistocene

Post-glacial—stratified clay, sand.
Glacial—boulder clay.



Overlooking Kamiskotia lake, from diabase hill to the southwest. July, 1910.

Pre-Cambrian

Post-Lower Huronian—quartz-diabase, etc.

(*Igneous contact.*)

Huronian—conglomerate, quartzite (coarse greywacké), slate or delicately banded greywacké.

(*Unconformity.*)

Laurentian—granite, intrusive into the Keewatin, and in part pre-Huronian.

(*Igneous contact.*)

Keewatin—The series consists chiefly of basic and acid volcanics, which are now much altered to schists, banded iron formation, rusty weathering carbonates, etc.

The Keewatin and Huronian have been subjected to much greater metamorphism than at Cobalt. From an economic standpoint these formations are the most important, since they contain the gold-bearing veins.

The post-Lower Huronian rocks are largely basic dikes of a diabase or gabbro character, and are of little significance in this area.

Keewatin

The Keewatin has a much greater distribution in the Porcupine area than the other members of the pre-Cambrian, and it is also of more importance economically, since it contains the greater number of the gold-bearing veins which have so far been discovered.



Indians on Night Hawk lake.

As in other parts of Ontario the series is highly metamorphosed, and many rocks are so much altered as to give little evidence of their original character. However, much of the series can be seen to consist of basic and acid volcanics such as basalts and porphyries, although these are often altered to schistose types. Where schistose, the general strike over a considerable area is found to vary from east and west to northeast and southwest, while the dip is generally steep to the north.

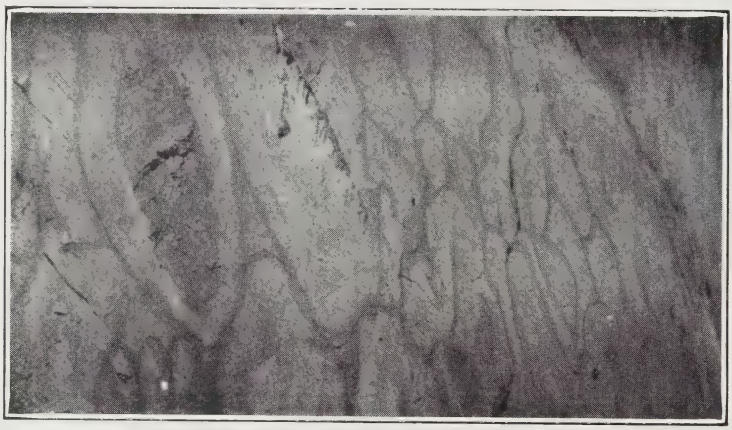
Among the more massive rocks are greenstones (basalts, etc.), which frequently show a striking ellipsoidal or pillow structure. Amygdules often accompany this structure and occur most abundantly along the rims of the ellipses. The centres of the ellipses are often bleached to a light greenish or whitish colour, whereas the margins are considerably darker. This structure is frequently seen in the northwest part of Whitney township. It is very pronounced in the greenstone along the shores of Night Hawk lake and on the islands in this lake. On the main land opposite Callinan's island in

Night Hawk lake, the ellipsoidal greenstone has been rendered quite schistose, so that the structure appears as alternate light and dark bands. Some of the greenstones have been brecciated and resemble conglomerate.

Serpentines occur in parts of the area in large volume. The range of hills immediately southeast of Porcupine lake are largely composed of this rock which is impregnated with much carbonate. Occasional veinlets of fibrous asbestos are seen, but this mineral was not noted in any quantity. A section of a sample of serpentine rock from the southeast shore of Porcupine lake is made up largely of fibrous serpentine, together with residual iron oxides, which in arrangement suggest original crystals like olivine. The remainder of the rock is dolomite. A chemical test showed the absence of chromium oxide in this rock.

In other thin sections are recognized diabasic and basaltic textures indicating that much of the greenstone is derived from rocks of this character.

The rock from the boundary between Whitney and Tisdale, about the middle of the fourth concession, is a fine-grained amphibolite, consisting essentially of hornblende, epidote, zoisite and calcite.



Ellipsoidal greenstone. Night Hawk lake.

The light-colored more massive rocks are principally quartz-porphyries and felsite, which in places intrude the more basic rocks. When the porphyry occurs in some volume, as around the Hollinger mine, the name rhyolite has been applied to it. Much of the porphyry has been altered to a sericitic schist, and frequently a rather massive rock can be traced into a very schistose one. This change can be well seen in the porphyry to the southwest of the Dome mine workings. A porphyry from the south half of lot 4 in the first concession of Tisdale, examined in thin section, shows the phenocrysts to be largely plagioclase feldspar, while quartz in rounded grains is also present. The groundmass is made up principally of plagioclase feldspar and quartz. Laths of tourmaline are scattered through the rock.

While many of the Keewatin rocks are now highly schistose, and can only be called hornblende, chlorite or sericite schists, occasionally remnants of amygdules, or eyes of quartz, in clear glassy grains, indicate the volcanic origin of some of them.

A spotted rock, from the northeast part of the West Dome in lot 5 in the first concession of Tisdale, is probably an altered amygdaloidal lava. The schistose matrix consists of secondary material, dolomite, sericite, etc., and the amygdules, whose margins are stained with limonite, are filled with calcite, sericite, and quartz. Some of the amygdules are an inch in length.

At times the Keewatin has been much crushed and broken, so that the rock has the appearance of a conglomerate; so much so that in the vicinity of the Dome mine, where graywacké and conglomerate occur, it is impossible to make a close line of distinction between the autoclastic and true conglomerate.

Iron Formation

Banded iron formation, grouped with the Keewatin, has an extensive development in parts of the area. It outcrops frequently in the southwest part of Whitney township in the first and second concessions. The disturbance in the formation here has not been so great as in other parts. Often the bands are lying almost horizontally. In places they have been somewhat brecciated, but otherwise little disturbed. The bands are



Indian camp, with potato patch. Kamiskotia lake. July, 1910.

alternate reddish or grayish sugary quartz and magnetite or hematite. Sometimes the narrow bands of magnetite, one-eighth inch thick, carry a merchantable percentage of iron, but these are relatively subordinate in comparison with the main mass of rock. It is unlikely that merchantable iron ore will be found in quantity. In parts of the formation iron pyrites replaces the magnetite. Almost horizontal, interbanded iron pyrites and silica are seen on the south half of lot 5 in the second concession of Whitney. A sample of banded quartz and iron pyrites gave 40 cents in gold per ton. Iron pyrites occurs in considerable quantity with a sugary quartz on lot 9 in the second concession, and might be worthy of investigation as a source of sulphur.

In Deloro and Shaw townships the iron formation is more highly tilted—generally from 60° to nearly vertical. Bands can be traced for several miles in a direction somewhat south of west. In this position, and especially where the iron ore is deficient, the formation greatly resembles wide quartz veins, and many prospectors have done

considerable stripping and prospecting along it. The formation is frequently cut by quartz veins in which visible gold sometimes occurs. In most cases the prospector has considered the iron formation itself to be a quartz vein or dike, and low gold values have been obtained from some of this material, especially where secondary iron pyrites is present.

Carbonate Rocks

In various parts of the area associated with Keewatin rocks are carbonates to which various terms have been applied, such as: dolomite, ferro-dolomite, ferruginous carbonate and ankerite.[5]

There is much uncertainty as to the origin of this rusty carbonate rock in different parts of the area. The carbonates may occur in at least three different ways, namely, as original bedded material, as a replacement, and as vein filling. Impure carbonates are formed also by the decomposition of basic igneous or other rocks.



Ferruginous carbonate intersected by quartz stringers. Night Hawk lake.

Dr. W. G. Miller, in his notes with the first edition of the Porcupine map, states that certain dolomites of the area may correspond to the crystalline limestone of eastern Ontario. Further he says: "It would appear not unlikely that carbonate in some places is a replacement mineral, and that a considerable volume of rock may at times have been replaced by carbonate."

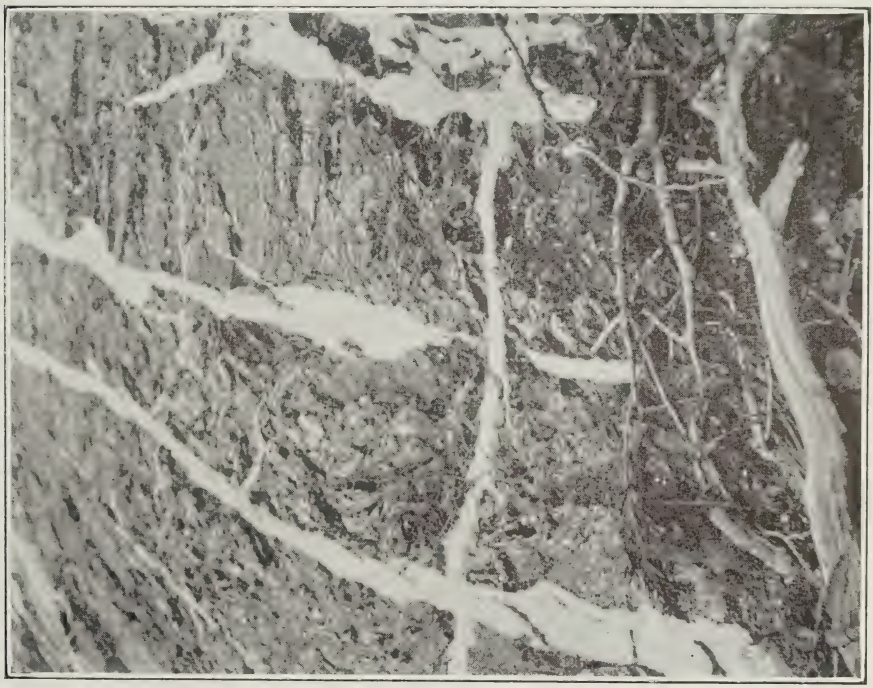
In the township of Deloro there are bands of carbonate which are closely associated with bands of iron formation which may be traced for several miles in an east-west direction. The relationship would suggest a similar origin for these rocks, that is, as beds deposited in sea water and now resting in an inclined position dipping to the north. These dolomite bands are frequently intersected with quartz veinlets, carrying some gold values, hence their importance. The bands have recrystallized and carry veinlets of later carbonate, as well as quartz.

In the northeast part of Tisdale and the adjoining part of Whitney, there is considerable rock which carries a high percentage of carbonate. This impure carbonate rock is much fissured by quartz veins, as on the Armstrong-McGibbon, lot 1 in the fifth concession of Tisdale, and other properties in the vicinity.

Several samples of rock which effervesce strongly with acid show an original igneous structure under the microscope. A sample from near one of the Davidson veins

[5] The name "ferro-dolomite" is not recognized by Dana and other authorities.

on the southwest quarter of the south half of lot 2 in the fifth concession of Tisdale is a medium-grained, greenish, much altered, igneous rock. Plagioclase feldspar, showing albite twinning, may still be recognized, and also micrographic intergrowths of quartz and feldspar. The remaining minerals are secondary—chlorite, calcite, etc., and make up a large part of the rock which is probably a quartz-diorite or grano-diorite. Another rock, taken from a cross-cut at 90 feet depth, on the Scottish Ontario property, is an altered basalt. The plagioclase feldspar is largely altered to saussurite minerals, while the ferro-magnesian mineral has gone to chlorite, and magnetite to leucoxene. Calcite is present in considerable quantity as a secondary mineral. Other examples



Ferruginous carbonate cut by quartz stringers. Night Hawk lake.

could be cited showing the replacement of igneous rock by carbonate. It is believed that this process has continued in some cases to such an extent that the rock is now largely carbonate, while the original rock constituents are leached out, or so altered as to show little trace of the igneous origin.

Analyses were made of some impure carbonates which occur with the quartz veins in northeast Tisdale.

—	1.	2.	3.
	Per cent.	Per cent.	Per cent.
Insoluble	51.82	58.63	47.35
Calcium carbonate	19.38	19.59	20.98
Magnesium carbonate	6.08	8.06	8.50
Ferrous carbonate	13.49	11.53	12.19

No. 1. is an impure carbonate from near the west end of the main quartz vein on the Davidson claim. N.W. ¼, S. ½, Lot. 2, Con. 5, Tisdale.
No. 2 is from the south wall at the east end of the vein and is quite schistose
No. 3 is from the Crown Chartered property—just northwest of No. 1 shaft.

Similar impure carbonates occur at the Armstrong-McGibbon, Scottish Ontario and other properties near by, and also in other parts of the area—as at the Rea vein, lot 6 in the third concession of Tisdale.

Microscopic examination of the above rocks shows them to be entirely secondary. There is an abundance of sericite and a minor quantity of quartz present in the sections.

That there has been considerable migration of carbonate solutions is shown by the manner in which almost all the rocks of this area are more or less impregnated with it. Sections of quartz-porphyry schist show the presence of much calcite as a secondary mineral. Veins and veinlets of ankerite occur frequently, not only in basic rocks but in the quartz-porphyry. On the Preston claim, immediately south of Simpson lake, there is a 3-foot vein of ankerite in quartz-porphyry. On the east Foster claim there is a similar vein in Keewatin schist.

The origin of some of the ankerite bands, such as are seen in the Curts "vein" on the West Dome properties, is difficult to explain. Analyses of samples of this ankerite show it to be almost free from insoluble impurities, in which respect it is quite different from the carbonate occurring in northeast Tisdale. The distinct walls of the band of carbonate suggest a vein or bed origin for it rather than a replacement. Analyses of carbonte from different parts of the Curts vein are given in columns 1 and 2.

—	1.	2.	3.	4.
	Per cent.	Per cent.	Per cent.	Per cent.
Insoluble	1.73	.....	11.42	.....
Calcium carbonate	50.63	51.28	46.63	42.76
Magnesium carbonate	29.57	29.82	28.77	19.86
Ferrous carbonate	14.15	14.70	5.39	12.01

No. 3 is an analysis of ankerite from a narrow vein on the east Foster claim (West Dome).

No. 4 is an analysis of a very dark gray ankerite from a vein on the Gray claim, Ogden township.

Similar Rocks in Other Areas

Carbonate rocks are characteristic of all the gold-bearing areas of northern Ontario.

Larder lake, which lies about 70 miles east-southeast of Porcupine, is referred to by Mr. R. W. Brock as follows:

The most interesting rock from an economic standpoint near Larder lake is a rusty weathering dolomite (?). About 60 per cent. of the rock consists of lime-magnesia, iron carbonate, the remainder of quartz and a soft green talcose silicate, probably serpentine. The origin of the rock is as yet a little uncertain. Certain dikes, when squeezed and altered, produce a rock which bears a strong resemblance to it, but its occurrence with slates and phyllites and with the cherts—undoubted sedimentary rocks—as a conformable band . . . . render it more probable that it is an altered stratified ferriferous dolomite, probably forming a member of the iron ore formation. This rock, especially where cut by the porphyry or pegmatite . . . . is traversed by innumerable stringers of quartz which in places are gold-bearing.[6]

Mr. Morley Wilson also refers to Larder lake, and to Opasatika lake to the east, as follows:

In the neighbourhood of Larder lake and north of lake Opasatika are local outcrops and bands of a rusty-weathering rock consisting of ferruginous dolomite or ankerite, with varying quantities of quartz and feldspar. It is always highly pyritic and in most localities contains a large amount of chrome mica or fuschite from which the rock derives its color. As a rule the rock is cut in a most complex manner by two or more sets of veinlets of quartz or of quartz and ferruginous dolomite, the dolomite occurring along the margin of the veinlet and the quartz in the centre.[7]

[6] Bur. Min., Vol. XVI. (1907), p. 207.

[7] Summary Rep. Geo. Sur. Can., 1909.

M. B. Baker describes a similar carbonate rock in his report on the Abitibi lake area,[8] and also A. A. Cole in his report on the gold-bearing deposit at Gold Island in Night Hawk lake.[9]

Some of the gold deposits on Temagami lake are associated with carbonate. W. G. Miller refers to these in his report on "The Iron Ores of Nipissing District":

At Ferguson point a pit has been sunk in quartz and dolomite. The appearance of these two minerals in association is interesting as the mixture of the two resembles closely the gangue of some of the auriferous mispickel ore bodies in Hastings county. There are some other masses of more or less silicious dolomite along this (northeast) arm of Temagami, in Emerald lake and elsewhere.[10]

A. L. Parsons describes a carbonate as occurring at the Regina mine, Lake of the Woods:

No. 3 vein is principally quartz, though in places a good percentage of a rusty carbonate is found intermingled with the quartz. The west vein which is about 20 feet wide, consists of two parts, that upon the north being quartz interbanded with rusty carbonate, while the southern portion consists entirely of this rusty carbonate.[11]

In the same area at West Shoal lake, A. P. Coleman describes the veins at the Oliver Daunais location as quartz mixed with a good deal of dolomite. In some cases the latter mineral contains a few specks of free gold.[12]

Carbonate rocks are also associated with iron ore deposits in northern Ontario, as at Helen mine, Michipicoten. In this locality there are masses of siderite impregnated with iron pyrites, from which, according to A. P. Coleman, the hematite ore has been derived.[13]

It will be seen that the carbonate rocks of the pre-Cambrian have a wide distribution in northern Ontario. They vary considerably in composition, but are represented for the most part by crystalline limestone in which $CaCo_3$ predominates. Other carbonates are ankerite, siderite and dolomite. In one locality the crystalline carbonate has the composition of magnesite.

A strikingly green colour is often seen in the ferruginous carbonate rocks of the area. It is well shown in these rocks on Night Hawk lake. N. L. Turner, Provincial Assayer, obtained decided reactions for chromium in a sample from Night Hawk lake, suggesting the presence of a chromium silicate. Mr. Morley Wilson describes a similar green mineral from Opasatika lake as a chrome mica or "fuschite."

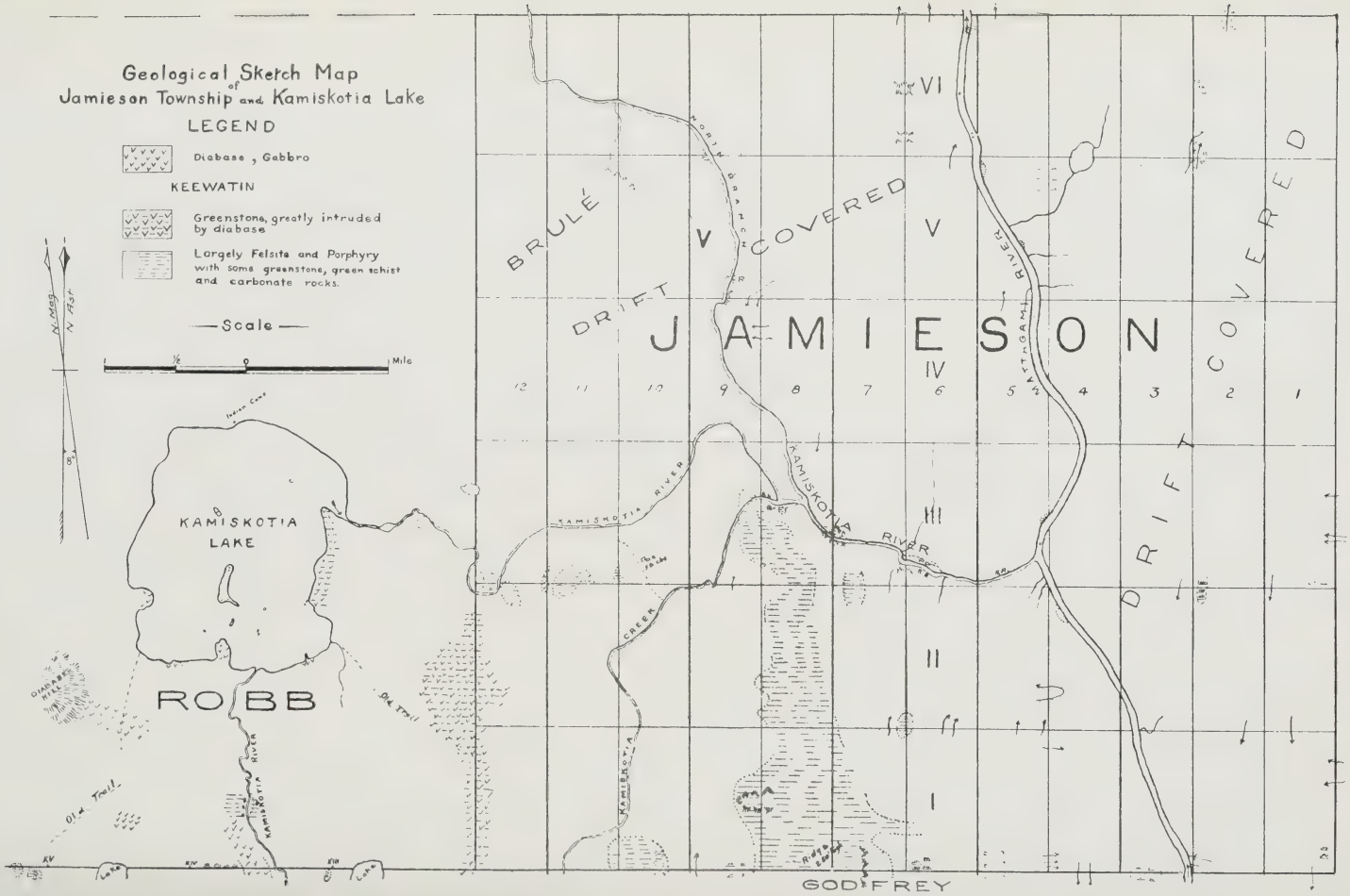
A similar mineral has been reported to occur on lake Abitibi and elsewhere.[14]

A chrome-magnesia mica (biotite) occurs in the township of Hyman, Algoma district.[15]

Fragmental Rocks

There has been included with the Keewatin some material which appears to be of sedimentary origin. For example, some of the schistose rock which outcrops at Wawaitin Falls and at points below, on the Mattagami river, has a graywacké structure when examined in thin section. On Red Sucker creek at the third rock exposure from the Mattagami river, there is a fresh-looking graywacké which greatly resembles some

[8] Bur. Min., Vol. XVIII. (1909), p. 270.
[9] Ibid., Vol. XVI. (1907), p. 220.
[10] Ibid., Vol. X. (1901).
[11] Ibid., Vol. XX. (1911).
[12] Ibid., Vol. VI. (1896), p. 105.
[13] Ibid., Vol. X. (1901), p. 193.
[14] Ibid., Vol. XVI. (1907), p. 219.
[15] Report Geol. Sur. Can., Vol. VI. (1892-3), p. 27 R.


Geological Sketch Map
of
Jamieson Township and Kamiskotia Lake
LEGEND
Diabase, Gabbro
KEEWATIN
Greenstone, greatly intruded by diabase
Largely Felsite and Porphyry with some greenstone, green schist and carbonate rocks.
Scale
Mile
N. Mag.
N. Astr.
KAMISKOTIA LAKE
ROBB
JAMIESON
BRULÉ
DRIFT COVERED
DRIFT COVERED
MOOSE BRANCH
KAMISKOTIA RIVER
KAMISKOTIA RIVER
KAMISKOTIA CREEK
KAMISKOTIA RIVER
MATTAGAMI RIVER
Old Trail
Old Trail
GODFREY
VI
V
IV
III
II
I
12 11 10 9 8 7 6 5 4 3 2 1

of the Huronian graywacké at Cobalt. The rock consists largely of fragments of quartz and feldspar with some bits of rock like quartz-porphyry in a cement of finer material consisting of quartz, feldspar, sericite, etc.

At the lower end of the third sandy portage on the Mattagami river below Timmins' landing, the rock is now schistose, but is made up of bands of coarse and fine material which tail out like sedimentary deposits. This rock, however, may be composed of volcanic fragmental material which has been water-sorted.

At the middle and upper sandy portages, the rock has a fragmental appearance in the field, but Mr. C. W. Knight, from an examination of thin sections, suggests that such rocks may have been originally quartz-porphyry, which is now much crushed and impregnated with carbonate. One sample contains somewhat rounded grains of quartz and feldspar in a fine interlocking matrix of quartz and feldspar, with sericite and calcite.

On the south boundary of Jamieson in lot 7, about 4 miles northwest of Sandy Falls, there is a volcanic rock, now somewhat schistose, but the porphyritic character of which is distinct, with phenocrysts of clear quartz in a dense dark gray felsitic groundmass. The rock described at Sandy Falls may be similar to this, but more highly altered.

Post-Huronian Dikes

In all parts of the area are numerous basic dikes which are generally less than 100 feet in width. Some of these are of olivine diabase. One such dike occurs on the south boundary of Whitney township in lot 12. The rock shows fairly fresh plagioclase set in ophitic fashion in augite. The latter mineral has a decided purplish colour, due to the presence of titanium. Grains of olivine showing high relief, a few scattered flakes of biotite and magnetite, also occur.

Basic dikes intruding Keewatin greenstone occur on several islands in Night Hawk lake. A thin section of one of these shows a diabasic texture. Rods of labradorite are set in augite, which is beginning to alter to green hornblende. Quartz is present in clear grains and as an intergrowth with albite.

A similar diabase intrudes the Huronian graywacké on the northeast bay of the lake. Many of these narrow basic dikes in this section greatly resemble the sill diabase of the Cobalt silver area.

A dike of diabase 10 feet wide cuts a ferruginous carbonate rock on the most southerly Dome claim in Tisdale. At this point the carbonate is not intersected by quartz veinlets, and it was not possible to determine the relationship of the dike to the quartz veins.

There is a very prominent hill about 250 feet high to the southwest of Kamiskotia lake which is composed of a basic rock, some of which is very coarse grained like gabbro. This mass is likely a great dike, with northeast-southwest strike, which crosses Niven's line two miles to the south-west.

Thin sections of two samples of the rock have the structure of gabbro, rather than diabase. Quartz, if present at all, is only in minor quantity, and the rock does not closely resemble the Cobalt sill diabase.

Huronian

Huronian rocks occur in various parts of the area, and are of importance, since on several properties they carry gold-bearing veins. The largest area of Huronian stretches from the Dome mine in a northeast direction for about ten miles. Unlike similar rocks at Cobalt, Gowganda and Larder lake, the series is highly inclined, and has been subjected to considerable metamorphism. The general strike of the upturned edges of the series varies from east and west to northeast and southwest, and conforms generally to the prevailing strike of the Keewatin rocks. Much of the deformation of the area was therefore in post-Huronian times. In some outcrops are recognized a succession of conglomerate, quartzose-graywacké, and delicately banded graywacké,

indicating well-sorted sedimentary material. This ternary succession of strata is characteristic of the Huronian at Cobalt and surrounding areas. Variously colored layers are often seen in the graywacké, and a secondary cleavage is frequently developed. The alteration of the Huronian even in this limited area has been varied. At times the strata show only as inclined beds, and again, as at the Foley-O'Brian, they have been so much crumpled that they show wavy bands along the strike. A thin section of graywacké from a mile west of the north end of Porcupine lake shows angular fragments of quartz and feldspar, together with sericite and other secondary minerals.

At the Dome property, in contact with the large quartz masses, is a conglomerate which is likely basal. On the weathered surface the included fragments of porphyry, greenstone, schist, etc. ,are conspicuous, but in freshly broken pieces the conglomeratic character is easily overlooked, since the rock breaks in prismatic blocks resembling schist. The included pebbles are frequently drawn out in the direction of the schistosity.

Huronian graywacké, with strike east and west and dip 85° north, occurs on the northeast shore of Night Hawk lake. In the graywacké are thin bands of conglomerate containing pebbles of dark green Keewatin rock, numerous quartz pebbles and some felsite. Some of the pebbles are 6 inches in diameter. A sample of the graywacké is seen under the microscope to consist of angular fragments of quartz and feldspar, with finer particles of the same material and chlorite, sericite and limonite.

Laurentian

A few outcrops of granite occur in the township of Whitney. This granite is a medium-grained biotite variety, and not typical of that occurring in large volume to the north and south of the area. In south Whitney it intrudes light-colored porphyry of Keewatin age, but its relation to the Huronian is not known.

About 40 miles north of the gold area there are frequent outcrops of granite and gneiss. The known outcrops of rock to the south are mainly of Keewatin age. Granite occurs on the Mattagami river just north of Loon portage, and the contact runs to the eastward, crossing the Frederick House river south of Neelands rapids, and thence southeasterly to near Iroquois Falls on the Abitibi. To the north of these points for some miles the rock exposures are largely granite or gneiss.

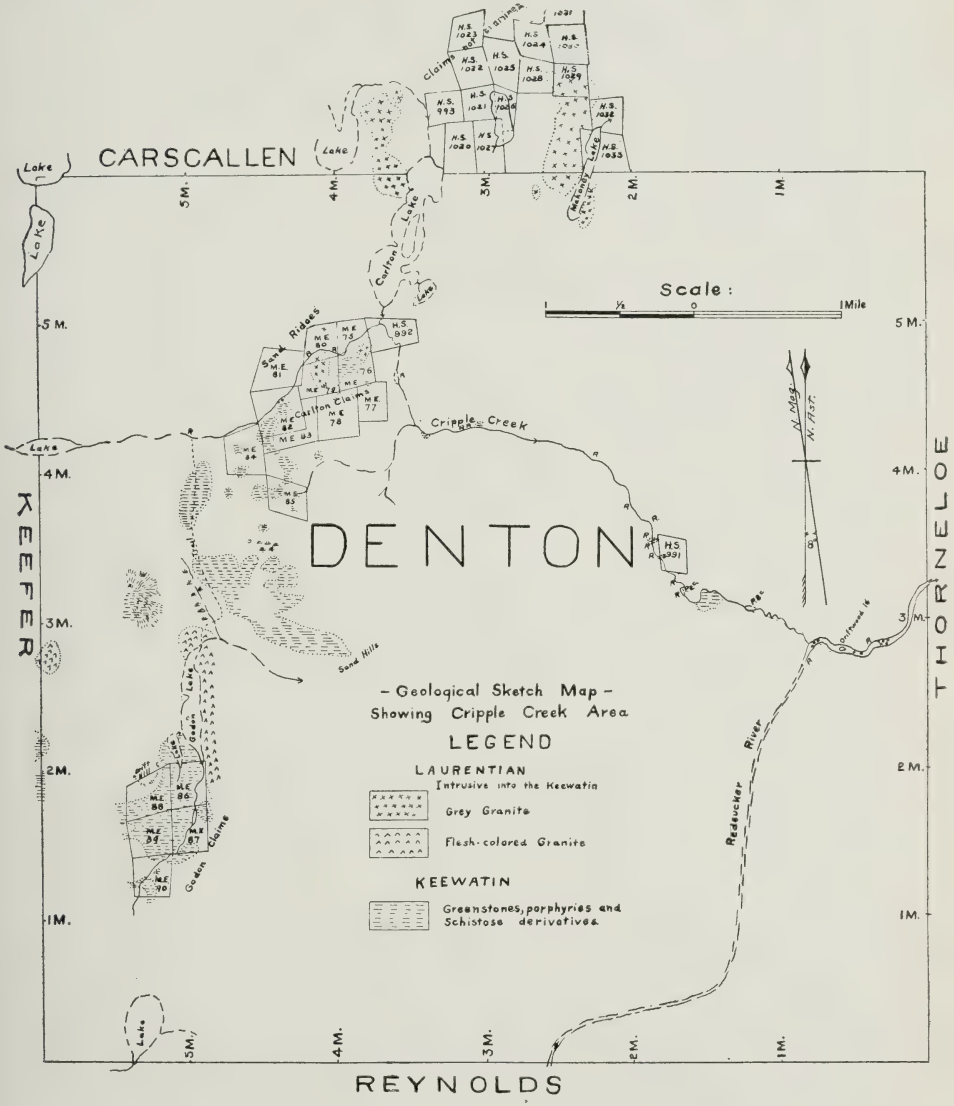
Again, granite occurs on the Mattagami river south of Wawaitin portage, which is southwest of Porcupine. There are also outcrops of this rock along the south boundaries of Price and Adams in association with basic Keewatin rocks, which they intrude partly as narrow dikes. The granites are largely of a flesh-colored hornblende, biotite variety. The only gneissoid structure observed is a paralleling of the constituent minerals. Some of the granite is porphyritic with phenocrysts of pink feldspar up to two inches in length. A reddish variety from the east boundary of Fripp township is a hornblende granite, showing in thin section quartz, albite, hornblende, apatite and titanite. The hornblende is partly altered to chlorite.

In the notes accompanying the first edition of the Porcupine map, it has been suggested that the formation of the bold-bearing veins is due to the intrusion of granite into the Keewatin and Huronian formations, and that the immense quantity of quartz present in the veins has been drawn from the residual silicious waters of this rock. During the past season no granite was seen directly in contact with Huronian rocks, so that the relation of the granite to the Huronian is not clearly known.

At one place on the south boundary of Langmuir township is a small patch of Huronian conglomerate which contains some pebbles of granite, so that at least some of the granite in the vicinity is pre-Huronian. No granite pebbles were found in the conglomerate in Whitney and Tisdale townships. It may be that the granite mass which threw off the silicious waters is at some depth, and does not show any surface outcrop in the vicinity of the gold deposits.

In the township of Denton, about 30 miles southwest of Porcupine, a gray biotite-granite intrudes Keewatin greenish and grayish schists. Gold-bearing veins have been found in both the Keewatin and in this gray granite rock, so there may be some relation-

ship between these quartz veins and the gray granite. A reddish hornblende granite occurs in the same township, but its relation to the biotite granite is not apparent. Where granites intrude the Keewatin, but are not found in contact with the Huronian, it is practically impossible to say whether their age is Laurentian or post-Lower Huronian.



Relation of Quartz Veins to Granite

Mr. C. W. Knight noted the occurrence of feldspar in a vein on the Miller-Middleton, one of the Timmins locations, and suggested the relationship of the deposit to granite or pegmatite dikes. It has been noted, too, in the main Hollinger and other veins. Feldspar is also seen in the quartz veinlets which intersect the carbonate rocks on Night Hawk lake. In the same locality are aplite dikes with fine veinlets of quartz from which low gold values have been obtained. It is possible that the quartz veins, quartz-feldspar veins and aplite dikes are but differentiations from the same magma.

The relationship of quartz veins to pegmatite and aplite has been mentioned by several writers. In the Black Hills of South Dakota, C. R. Van Hise noted the gradual transition from intrusive granites through pegmatite dikes and with decreasing quantity of feldspar to quartz veins remote from the granite.[16]

J. E. Spurr in "The Geology of the Yukon Gold District, Alaska," referring to a set of younger quartz veins on Forty Mile creek, says: "They often contain a little feldspar and sometimes, by increase in amount of this mineral, pass into a variety of fine pegmatite. This in turn seems to be transitional into a coarse aplite which is very abundant."[17]

De Launay in his work, "The World's Gold," refers to the relation of gold to the granitic rocks. "At Berezovsk in the Urals in certain veins of microgranite, which themselves cut talcose schists, there are numerous very thin veins of auriferous quartz, containing various sulphides of copper, lead and bismuth, with gold, chromium, and tourmaline, and the granitic mass from which the microgranites are derived appears itself to be auriferous."

In support of the theory of the relation of the quartz veins of Porcupine to granite intrusions, may be mentioned the following:

1. The irregular occurrence of the quartz in many of the deposits, in lenticular masses, resembling pegmatite dikes.

2. The occurrence of feldspar and tourmaline in the quartz in several deposits.

3. The great pressure at which the quartz has been deposited, indicated by the presence of liquid inclusions and gas bubbles. These are frequently seen in quartz in granites.

4. The frozen contacts of quartz and enclosing country rock. The free walls seen at some properties indicate a secondary movement in the quartz since these walls are slickensided. Where free walls exist they may be either the hanging or foot wall, while the other wall is indistinct—grading into the country rock.

5. The occurrence of narrow aplitic dikes, frequently cut by minute veinlets of quartz which represent the final solidification of the aplite magma and frequently carry gold values as on Night Hawk lake.

Character of the Gold-Bearing Deposits

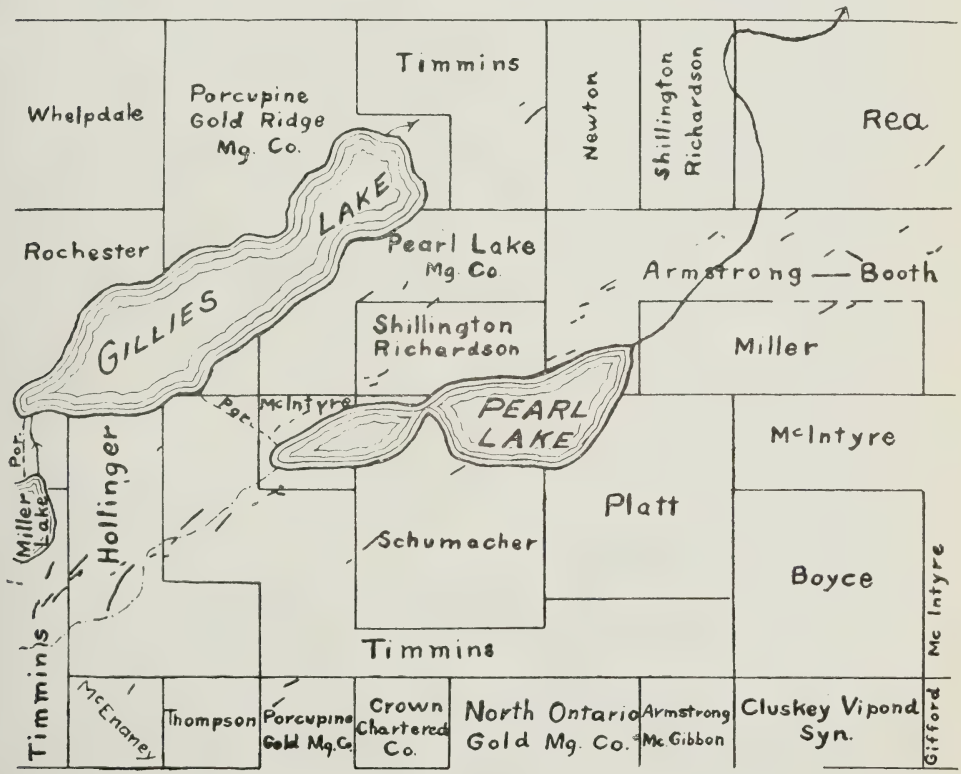
The occurrence of gold at Porcupine is associated with the quartz solutions which circulated through the fissures in the Keewatin and Huronian series. The irregular fissuring has produced a great variety of quartz structures, varying from the tabular, though often irregular or lenticular, vein which may be traced several hundred feet, to mere veinlets, often only a fraction of an inch in width and a few feet in length, which ramify through a rock that has been subjected to small irregular fissuring. This latter variety is well illustrated in the fissuring of ankerite bands, so characteristic of many of the gold deposits of Porcupine. Irregular and lenticular bodies of quartz often occur which may have a width of ten or twenty feet, but which die away in a distance of fifty feet. Again there are dome-like masses of quartz which are elliptical or oval in surface outline, but whose underground extension has not been examined closely.

[16] U. S. Geological Survey, 16th Annual Report, Principles of North American Pre-Cambrian Geology.

[17] U. S. Geological Survey, 1896.

In some parts at least these masses can be seen in contact with underlying rocks at a low angle, which would suggest that they are broad lenticular masses which have filled lateral fissures in the country rock. The most conspicuous dome masses are those of the Dome property where the two largest are about 125 feet by 100 feet. A fissure may be vertical and regular at some points. At others it may incline at a lower angle to the horizontal or take on a more or less lenticular form.

The relationship of the strike of the veins to that of the enclosing rock is often difficult to determine, since generally along the veins there has been shearing of the country rock which may conform to the general direction of the strike of the veins. However, by determining numerous strikes in the schist away from the veins, it is seen that the majority of them are inclined to the direction of strike of the enclosing



Distribution and strike of veins near Pearl Lake.

rocks. In dip the veins vary from vertical to nearly horizontal. In No. 1 shaft of the Hollinger the vein is practically vertical, while a series of narrow quartz veins, 6 to 18 inches wide on the Lindburg claim, have a dip at the surface of only 20°. The prevailing dip of the schist in the Porcupine area is to the north at a high angle, and frequently the veins dip distinctly to the south across the cleavage of the schist. While it is apparent that most of the deformation of the country antedates the vein formation, nevertheless there is a decided tendency in many cases for the fissuring to be influenced by the direction of schistosity, which is also a direction of weakness; hence we find veins having a more or less lenticular structure the strike of which closely corresponds to that of the country rock.

Distribution of Veins

While gold-bearing veins occur over a wide area and are often isolated, it is seen, from a number of those already discovered, that they occur in groups along certain lines. For instance, in Tisdale township there are at least three distinct areas where the fissuring has been most pronounced. One such area extends from the southeast end of Miller lake, on lot 11 in the first concession, in a northeasterly direction for three miles, and includes such veins as the Miller-Middleton, Hollinger, McIntyre and Connell or Rea, and in addition many others with visible gold. The average strike of the veins here is northeast-southwest. Another series, including the Davidson, Crown-Chartered, Armstrong-McGibbon, and Bannerman (in Whitney), occurs in the northeast part of the township in the fifth concession. The general direction of the veins is east and west. Again in the southeast part of the township is a group including the Foster, Dome and Dome Extension, with general strike somewhat south of west. Similar groupings could be mentioned in other parts of the area.

In these disturbed zones the country rock is generally schistose in character. At the Dome mine the disturbed area has a width of about 600 feet, in which there are numerous narrow quartz veins in addition to large irregular quartz masses.

Well defined, disturbed zones occur in the fifth concession of Tisdale. In this locality the main rock is a light greenish, fine-grained, rather massive greenstone. This greenish rock is itself not much fissured, but here and there through it are bands of rusty-weathering carbonate, which is generally schistose, striking east and west. I think that much of the carbonate associated with this greenstone is of secondary origin. It is possible that the shattering and fissuring of the greenstone in an east and west direction may have caused a deposition of migrating carbonate solutions, partly filling fissures and partly replacing the greenstone. These carbonate bands were later fissured, and gold-bearing quartz solutions deposited in them. The fissuring of the carbonate is generally irregular, and hence we find veins with steep or low dip striking with the schist and across it. This irregular series of veins is seen at the Crown-Chartered and Armstrong-McGibbon properties. Where the veins are small, it becomes necessary to mine both the carbonate and the intersecting quartz veins. Gold often occurs in the carbonate near the contact with the quartz veins, as well as in the quartz.

Distribution of the Gold

While the quartz is considered to carry the gold, it was noted at many properties that the metal occurs in greatest quantity along certain lines which give a streaky character to the ore. On the surface these streaks are rusty due to the oxidation of pyrites, while at depth they are dark gray or greenish in colour.

Thin sections of quartz from the main Hollinger vein show grains of quartz with irregular outline, which often contain liquid and gas inclusions. There has also been much secondary pressure, indicated by strain shadows or wavy extinction, and along lines of slip or fracture planes there has been much crushing of the quartz to finer grains. In these crushed areas are secondary minerals like calcite, sericite, etc., while iron pyrites is also present in cubical form and has evidently crystallized, subsequent to the crushing.

Some thin sections from the Rea mine main vein also show much secondary crushing along lines. Calcite and sericite are present in the crushed quartz generally in linear arrangement, and in addition there are several rough crystal outlines of free gold which were formed subsequent to the crushing.

These fine dark streaks may have resulted from a solidification and shrinkage of the quartz forming filmy cracks, which may have become slip or crushing planes along which the richer gold-bearing solutions were deposited at a later period.

These minute dark streaks in the quartz are frequently slickensided, and this character may often be seen in hand specimens, as from the Rea or Vipond mines.

It should be noted that where cracks or fracture planes have been produced in a quartz vein and subsequently filled by minerals from solution, secondary quartz can be



West outcropping of Armstrong-McGibbon ore body.



Narrow quartz veins in Keewatin carbonate schist at Dome property. Nov. 1910.

distinguished with difficulty, if at all, from the original quartz. Hence it is not always possible to say whether visible gold in such a vein occurs in the original or in secondary quartz.

Carbonates of lime, magnesia and iron occur with the quartz in practically all the veins in the area. This material may have been absorbed from the wall rock, which is frequently dolomite or rock impregnated with dolomite or calcite. Fragments of country rock are often included in the veins. Veinlets of clear calcite occasionally cut the quartz veins.

The distribution of the gold is generally irregular, occuring along one or both walls, while other portions of the vein may be very low grade. Most spectacular showings occur on many properties, but these are limited to portions of the veins. Considering the irregular character of certain veins and the quantity of country rock which will need to be mined, the ore must be considered low grade.

Iron pyrites occurs in massive and crystallized forms, somewhat sparingly in most of the veins. Cubes of pyrites are frequently abundant in the enclosing rocks, especially where sericitic or dolomitic schist occur. A sample of cube pyrites was separated from the schist, obtained from a shaft of a principal property, and an assay gave a gold content of $10.40 per ton.

Copper pyrites, galena, zincblende and pyrrhotite are found in some veins in very minor quantity. Sulphide of silver, argentite, occurs in association with the gold on the Powell property in Deloro township.

It will be seen from an examination of the ore from most of the properties that it is largely free milling, while the concentrates should be amenable to cyanide treatment.

Little is said in this report as to actual values of properties, since their sampling is the prerogative of their owners. Many samples were taken for assay, rather for the determination of the distribution of the gold, which was found to be irregular and to be associated with the secondary fracturing of the quartz (and schist) in many cases. The determination of the value of properties is a matter requiring considerable development accompanied by extended sampling and mill tests.

In the following is a brief description of a few of the working properties. Gold has been discovered on many claims, some of which discoveries are of recent date. A part of the coming summer will be devoted to an examination of these properties.

The Dome Mine

This property, comprising six claims, is situated in the first concession of Tisdale, and includes parts of lots four and five. The main workings are on the northwest forty acres of lot four. In an area, which is roughly 600 feet wide north and south and 800 feet long east and west, there are frequent occurrences of quartz in irregular masses and narrow quartz veins, in some of which there is visible gold. Toward the east end of the workings there are large dome-like masses of quartz in contact with Huronian conglomerate and slate-like greywacké, while to the west the quartz occurs chiefly as narrow veinlets associated with Keewatin schist which is impregnated with carbonate. The country rock in the proximity of the veins contains considerable crystallized iron pyrites. The general distribution of the quartz masses and veins is shown on the detailed map of the Dome accompanying this report.

The surface of this deposit was sampled during the summer of 1910, while a part of it was tested by underground workings, consisting of five shafts, one raise, and about 1,000 feet of drifting and cross-cutting at the 40-foot level. In addition, seven diamond drill holes averaging 400 feet tested the property at various points. During the latter part of the summer a 1,500-lb Nissen stamp was used for sampling purposes. As the result of this prospecting the company decided to equip the property with a modern 40-stamp mill and cyanide plant, to treat the mass as a low grade ore body, mining both schist and quartz.



Quartz masses in connection with schistose conglomerate. Dome mine. Nov., 1910.



Quartz mass at the Dome mine.

A main 8′ x 18′ shaft will be sunk to the north of the present No. 2 prospecting shaft. Both the mine and the mill will be operated by electric power, for which purpose about 1,000 horse power will be required. Ten air drills will be used for breaking down the ore.

The mill treatment of the ore will be as follows:—

Preliminary crushing will be done in two stages, using No. 7½ and No. 5 Kennedy gyratory crushers. Belt conveyors will carry the ore to the stamp feed bins. Chalmers and Williams' 1,250-pound gravity stamps will be used with straight-back rapid-discharge type mortars, screen 18-mesh or coarser. The foundations will be reinforced concrete. Outside amalgamation will be adopted. Superimposed Dorr drag classifiers will be installed over tube mills of the El Oro type, which will be followed by a second set of amalgamating plates. Hydraulic cone classifiers will discharge back to tube mills and overflow to Dorr thickeners. Agitation will be accomplished in a series of continuous Pachucas. Combined thickeners and press tanks will feed to Merril slime presses, which will discharge through automatic tailing samplers.

The gold will be precipitated by the Merrill zinc-dust process. The zinc-dust will be fed by a short conveyor belt, operated by means of floats and counter-weights, at a rate proportional to the volume of solution pumped from the tank. The zinc-dust will be discharged into a mixing cone and the emulsion agitated by a jet of air. A small stream of barren solution will provide a constant overflow which will carry the emulsion down a pipe to the suction of the pump. The solution will be pumped to triangular precipitating presses, precipitation taking place entirely during the passage of the solution through the pump, pump-column and presses. The precipitates will be acid-treated, fluxed and smelted.[18]

West Dome Mines

This property, commonly known as the Foster, is directly southwest of the Dome in lots five and six. There are several veins on this property, some of which occur near the Dome boundary. These are narrow, averaging possibly two feet in width, and consist of ankerite and quartz. One shaft has been sunk to a depth of 25 feet on a vein which dips about 75° to the north. The greatest attention, however, has been paid to the deposit known as the "Curts vein," which is situated in the southwest part of the property. This vein has been stripped at various points, over a distance of 1,200 feet, showing a width of about three feet up to twenty-two feet. The deposit has well-defined schist walls, and dips steeply to the north. In proximity to the vein the country rock is rusty weathering, but away from the vein is a greenish Keewatin schist. The main mass of the lode is a lime-magnesia-iron carbonate, the composition of which is given earlier in the report. This mass is variously called ankerite or ferruginous carbonate. In fresh material the carbonate has a gray to light bluish colour, but on the surface is much stained to a rusty brown, which has resulted partially from the oxidation of iron pyrites but chiefly from ferrous carbonate. In parts of this carbonate rock there has been fracturing and filling with quartz and a later carbonate The quartz veinlets vary from mere threads up to two feet in width, the widest of which are mostly transverse to the strike of the lode and end abruptly at the schist walls. Unequal weathering of carbonate and quartz has resulted in a striking ribbed structure. Native gold occurs in patches in the quartz and also in the carbonate near the quartz, indicating an enrichment of the carbonate from the quartz veins. When the property was visited on February 21st the development consisted of only two shafts, which were down 32 feet and 45 feet respectively, so that little was known at that time as to the actual value of the deposit.

[18] Canadian Mining Journal, Vol. XXXII., No. 4, p. 126.



Ankerite intersected by quartz veinlets, West Dome. Oct., 1910. View looking south across the lode.



Looking west along the ankerite lode on the West Dome property.

The Hollinger Mines

The property consists of four claims lying to the east of Miller lake in the southwest part of Tisdale. There are a number of quartz veins which have a general northeast and southwest strike. The distribution of these is shown on the detail plan of the Timmins properties accompanying the Porcupine map. Development has been largely confined to the southeasterly vein of the series, which is generally known as the main Hollinger vein. This vein has the characteristic lenticular structure, which is frequently seen in this area, widening in places to 15 feet and again narrowing to a few feet. Two vertical shafts, No. 1 and No. 3, 625 feet apart, have been sunk 100 feet. Of these No. 1 is a 14 x 6½ ft. 3-compartment shaft, and has been used as the main working shaft. No. 2 shaft, which is midway between the others, was discontinued at 60 feet.



No. 1 shaft at Hollinger mine. March, 1910.

No. 1 and No. 3 have been connected at the 100-foot level by a drift along the vein. On February 19th this drift had been extended 300 feet northeast of No. 1 shaft, and at a point 120 feet from No. 1 shaft a 6 x 9 ft winze had been sunk 114 feet. The vein as exposed at the surface, at the bottom of No. 1 shaft and at the bottom of the winze is nearly vertical. A cross-cut had also been run from a point 110 feet south of No. 1 shaft 100 feet to the southwest towards the second vein of the series.

The gold in the ore occurs chiefly along dark seams in the quartz in which there is iron pyrites. These seams are well distributed in much of the quartz in this vein. Copper pyrites, zincblende and galena occur in minor quantity. Other minerals in the vein are calcite, dolomite, sericite and chlorite. Fragments of wall rock are frequently included in the vein. The wall rock is a grey sericitic schist impregnated with carbonate and iron pyrites.

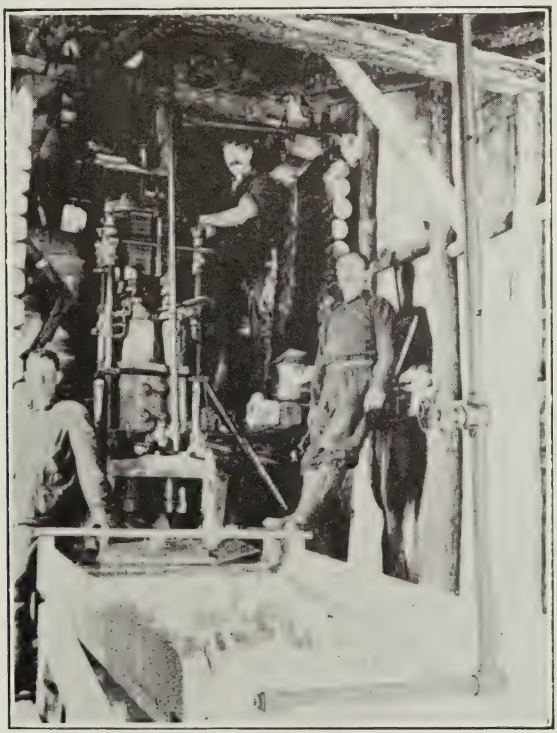
For the past year a 2-stamp Tremaine mill has been treating about 4 tons of ore per day, which represented only a small portion of the ore raised from the mine during development.

Much of the wall rock, which is impregnated with iron pyrites, is said to carry gold values for some distance from the veins. This can be treated with better results by cyaniding.

A mill will be erected during the coming year.



No. 1 shaft at Hollinger mine, showing ore dump. Oct., 1910.



Two stamp Tremaine mill, Hollinger mine.

The Rea Mine

The Rea property consists of two adjoining 160 acre veteran claims in the north half of lots 6 and 7 in the third concession of Tisdale. Several veins, with visible gold, have been discovered on the property, but most of them, beyond stripping, have not been developed. Attention has been chiefly confined to the vein known as the Connell, which is on the lot line between the claims. This vein strikes north 47° east magnetic, and has been traced, partly by trenching in the low ground to the northeast, a distance of 300 feet. When seen in February this vein was being tested by two shafts 150 feet apart. The more northerly No. 1. or "Kingsmill" shaft had been sunk vertically to 85 feet, while at 75 feet cross-cuts had just been started. The vein where exposed at a depth of 30 feet has a dip of 85° northwest. The hanging wall, which is well defined, is much slickensided and grooved vertically. The quartz has been subjected to much movement, showing frequent slickensides along dark seams, which occur for the greater part in the direction of the vein and show over a width of about two feet. Numerous stringers of quartz, from a few inches to two feet in width, extend from the main vein into the foot wall. The greatest enrichment occurs along the north wall, where gold is frequently seen along the dark seams in association with iron and copper pyrites. A little native copper was found near the surface in No. 2 shaft. This shaft, the "Eakins," was being sunk on the inclination of the vein and had reached a depth of 25 feet.

Preston East Dome Mines

On the Preston claim, H. R. 826, in Deloro township adjoining Tisdale, the rock associated with the gold veins is a quartz-porphyry, which in part has been fractured and filled with narrow quartz veins, some of which will average from 5 inches to 15 inches in width. These narrow veins cut across the general strike of the formation in a north and south direction. In places the porphyry has been sheared and fractured, showing dark seams along which gold sometimes occurs. When seen in November, 1910, the property had not been developed beyond some stripping and a few shallow pits. During the winter a compressor plant and 2 Nissen stamps were taken in to test the property.

Armstrong-McGibbon

On the Armstrong-McGibbon claim, the northwest quarter of the south half of lot 1 in the fifth concession of Tisdale, there is a band of impure carbonate rock with an east and west strike, which towards the west is exposed for a width of 50 feet. This rock has been considerably fractured in an irregular manner, and quartz veins occur at many points. These veins, towards the west part of the band, have a dip to the south at about 35°, whereas the schistose carbonate rock dips to the north. Gold has been found in very coarse and spectacular form at several places in the quartz, and the best values are obtained along the line of quartz and schist, especially where slips occur. On the west part of this band of fractured rock a 7 x 9 ft. shaft had been sunk 65 feet, encountering narrow veins of quarts dipping to the south, in all totalling about six feet. Six hundred feet to the east a second shaft had been sunk 30 feet. Here the quartz veins have a decided dip to the north.

The property was equipped with a 30-h.p. boiler and a 6 x 8 ft. hoist, and drilling was being done by hand.

Scottish Ontario

On the Scottish Ontario property in northwest Whitney there are several veins exposed on the surface with approximately east and west strike.

An 8½ x 5 ft. shaft had been sunk 100 feet and at 90 feet cross-cuts had been started north and south. The north cut had been extended 80 feet, while at 50 feet it

cut a mass of quartz on which drifting had just begun. The rock in the cross-cut is Keewatin greenstone, a soft decomposed basalt at the breast and a hard quartz diorite at 30 feet from the shaft. This hard rock was also exposed in the shaft at 40 feet. The cross-cut was to be continued northward to cut two well-defined veins which were exposed on the surface for over 400 feet.

A 24-h.p. boiler is used to run the hoist, and drilling is done by hand.

Powell Claims

The claims of the Powell group are in the northeast part of Deloro township. A band of rusty weathering carbonate with much serpentine occurs on M. E. 22, M. E. 21 and adjoining claims. This band has a strike somewhat south of west, varies in width from 35 feet up to 75 feet and dips to the north at about 60°. In parts of this band there are veinlets of quartz and dolomite in which visible gold has been found. The veinlets of quartz have a general strike of northeast and southwest. In one part argentite occurs in association with the gold.

Two 50-foot shafts one-half mile apart have been sunk in the hanging wall of the carbonate band at points where the rock is much intersected by quartz veins.

Vipond

This property is the principal claim of the Porcupine Gold Mines Company.

There are several narrow quartz-ankerite veins having a general northeast and southwest strike. When visited in February last the main development had been confined to No. 3 vein, which had been traced for several hundred feet on the surface. A 4½ x 9 ft. 2-compartment shaft had been sunk to the south of the vein a depth of 100 feet, and a cross-cut of 42 feet made to the vein. Drifting had been started in both directions along the vein which at this depth showed a width of 18 inches to 2 feet, dipping to the southeast at about 83°. The vein consists largely of quartz, but in addition there is considerable carbonate, some in the form of clear calcite.

On No. 3 vein a shaft had been sunk 50 feet, but at 23 feet the vein dipped out of the shaft and no cross-cut to it had been made.

One Nissen stamp was in operation and a small amount of bullion had been produced.

Foley-O'Brian

This property is situated half a mile west of the south end of Porcupine lake, where, on a ridge of Huronian rock which outcrops through the drift, the main workings are located to the north of the main road.

No. 1 shaft has been sunk 70 feet. The surface was not exposed, but it was stated that this shaft had been sunk on a quartz outcropping. As seen underground, the quartz appears to occur as a lens, but more development is necessary before the character of the ore body can be determined.

At the 37-foot level the quartz mass is about 26 x 35 feet in horizontal dimensions, while it shows in the shaft for 20 feet deeper, and from a lower cross-cutting appeared to be dipping to the east.

A second shaft had been started to the south of No. 1 shaft on high ground, since the first shaft was located close to a creek and much water was encountered.

A 4-drill compressor plant had been installed and 3 drills were in operation.

Messrs. E. L. Bruce, P. E. Hopkins, W. L. Uglow, A. W. Gray and R. C. Easton acted as assistants during the season of 1910.

Mr. C. W. Knight spent a short time in the field making a detailed map of the area in the vicinity of the Hollinger.

The topographical part of the survey was in charge of Mr. W. R. Rogers.

The assays and analyses mentioned in the report were made by Mr. N. L. Turner, Provincial Assayer, Belleville.

WATER POWERS IN THE PORCUPINE AREA

The value of water powers has increased greatly in recent years owing to the introduction of electricity and long distance transmission of electrical energy. To-day practically all water power developments may be classed as hydro-electric. Hence it is easy to see the great possibilities afforded by Ontario's hinterland, which abounds in water powers.

Some idea of our resources in this particular may be obtained by referring to the Reports of the Hydro-Electric Commission. In addition Mr. L. V. Rorke, Inspector of Surveys, has contributed a valuable paper on "Water Powers on our northern slope to James Bay, Province of Ontario."[1] In this part of the Province alone he estimates the total available horse-power at two million. If Ontario lacks coal the disadvantage is offset by the great opportunities afforded in the ultimate development of her "white coal" resources. The application of hydro-electric power to mine operation in Ontario was the subject of an article by E. T. Corkill, Inspector of Mines, in the last report of the Bureau of Mines.[2]

A copy of the Regulations stating the conditions under which water powers are leased may be had on application to the Department of Lands, Forests and Mines, Toronto.

It is the intention in this article to refer only to those water powers within easy radius of the Porcupine gold area. The importance of such water powers in close proximity to a mining camp does not call for further comment.

Grassy Falls

On the Grassy river at the boundary line between the townships of Price and Fripp there is a series of falls and rapids, somewhat in the shape of a horseshoe, with a total descent of 106 feet. A flume and pipe line cutting across the horseshoe would be one-half mile in length. At low water stages, without storage, the river will have a flow of about 100 cubic feet per second. This is equivalent to 1,000 horse power.

Waiwatin Falls

This falls is situated on the Mattagami river in the northeast part of the township of Thorneloe. Like the water power on the Grassy river, this is a series of falls and rapids and of similar shape. For development purposes a flume and pipe line about 70 chains long will be required. The total fall under natural head is 116 feet, and the flow 400 cubic feet per second, at low stages, giving about 4,000 horse power. The drainage area at this point on the river is approximately 1,200 square miles.

Surveys and plans for this development have been completed, although no machinery is on the ground. The transmission line has been located on sand plains and jack pine ridges for almost the entire distance, with the object of constructing either a wagon road or electric railway. The dam required can be easily constructed. E. A. Wallberg has leased this water power and under the conditions must develop 4,000 horsepower of electrical energy by September, 1912. The transmission line to the Hollinger mine is eleven and one-half miles in length.

Sandy Falls

Sandy Falls is located on the Mattagami river in concessions IV. and V., Mountjoy. This water power consists of a series of three falls with intervening rapids and swift water. The upper part has been leased to the Porcupine Power Company, while the lower part is under lease to other parties. Under natural conditions the total descent is 44 feet.

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[1] Annual Report of Ontario Land Surveyors, 1910.

[2] "Water Powers for Working Mines,' Bur. Min., Vol. XIX. (1910), Part I.

Active development work by the Porcupine Power Company has been carried on during the past winter, and the company expects to supply electrical energy by early summer. Two electrical units of 1,500 horse power each are being installed. The transmission line from the power house to the Hollinger mine is six miles in length. The right-of-way, 132 feet in width, has been cleared of timber and a pole line erected.

At Sandy falls the natural head has been increased by a dam which will eliminate all current from the river as far upstream as Timmins Landing, or the mouth of Mountjoy creek. This will allow the power plant to operate under an effective head of 34



Part of Waiwatin falls on Mattagami river.

feet. Although the available head here is much less than at Wawaitin the volume of water is greater. The drainage area of the Mattagami river at Sandy falls has been increased to about 2,500 square miles by the additional territory supplying tributary feeders, namely, Mountjoy creek and the Grassy and Redsucker rivers. Thus, without storage, a flow variously estimated from 800 to 1,400 cubic feet per second will be obtained at low water stages. Lakes near the head waters of the Mattagami can be dammed, thereby retaining flood waters to increase the flow at low stage periods. Experience has shown that many of the rivers of northern Ontario have an average flood discharge of about twenty times the low water flow.

THE ALEXO NICKEL DEPOSIT

By W. L. UGLOW

Location

The Alexo mine, as the ore-deposit has been called, is situated on lot 1 in the third concession of Dundonald township, very close to the boundary of Clergue; "Mileage 222," on the Temiskaming and Northern Ontario Railway, is 4½ miles to the northeast of the mine, and an old winter road from Kelso Mines to Porcupine passes a few yards from the workings.

Topography

The general appearance and relief of the country do not suggest the presence of ore-bodies. It is part of the "clay belt" and partakes of its well known characteristics. Frederick House lake lies in a shallow depression some three miles to the west of the mine. The land for a distance of a mile and a half to two miles from the lake is a rolling clay loam, thickly timbered with spruce, balsam, poplar, birch, etc. This area is succeeded by a sand plain reaching down from the north, which has been recently burnt over. To the south and east of the sand plain are found the only rock exposures of the township, with the exception of a fringe bordering the promontory on the east shore of the lake, and an island immediately to the south of this. Concessions 1, 2, 3, lots 1, 2, 3, Dundonald, and the western part of Clergue, contain the main body of the rock mentioned, exposures of which sometimes rise in a sheer wall to a height of nearly 100 feet.

Geology

Serpentine

The oldest rock of the district is the so-called "serpentine," with which the ore-body is associated. It is only exposed in this one place, is of small extent, and reaches a maximum height of about 25 feet above the swamp. Microscopic examination proves the rock to have the make-up of a Wehrlite, but the chemical composition seems to indicate a closer connection with the related group of Harzburgites. At any rate, it is a very highly serpentinized member of the peridotite group. The most interesting feature in connection with the rock, and one which is of great importance in working out the origin of the ore-body, is the porphyritic tendency evidenced by the olivine. The crystals are to a very large extent idiomorphic, and well differentiated from the groundmass. Octahedral crystals of chromite are abundant in the sections, and the chemical analysis gave 1.65 per cent. Cr_2O_3. Like other exposures of serpentine rock in the north country, it is well seamed with asbestos veinlets of moderately good fibre.

Rhyolite

In contact with the serpentine, and probably intruding it, is an exposure of a massive rock. Microscopic and chemical investigation prove the rock to be a rhyolite, with small phenocrysts of quartz, which have been broken, due to mechanical crushing. The rock is quite common in the district, and rises to heights of 75 and 100 feet. No criterion is afforded by which to determine its age, but the field and microscopic characteristics strongly suggest a volcanic effusion of the Keewatin period.

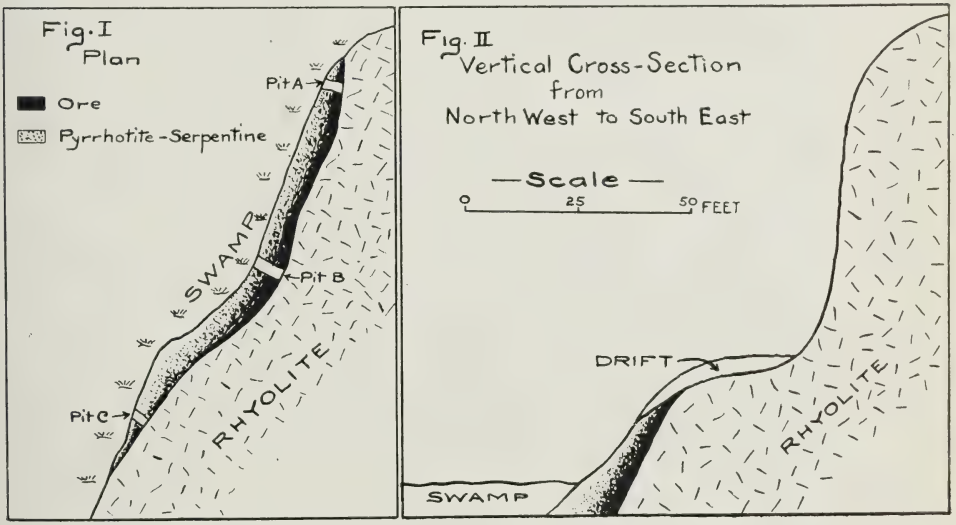
Diabase

Five exposures of a very coarse grained diabase are found in the area. It occurs in boss-like masses not rising more than 25 feet above the ground. In the polished hand specimen, the ophitic structure is striking, and lath-shaped crystals of labradorite often

half an inch long penetrate the grains of the dark minerals, augite and biotite. The rock is still quite fresh, and in all respects, except the exceeding coarseness of grain, resembles very closely other diabases of the north country. It is quite probable that the age of the rock is post-Middle Huronian, and that the exposures represent the much eroded remnants of a sill.

Occurrence and Nature of the Deposit

The ore-body, as shown in the sketch, occurs on the northwest side of an exposure of rhyolite, measuring about 700 feet by 900 feet, just where the latter comes into contact with the serpentine. The rhyolite rises on its north and west sides rather steeply to a height of about 100 feet out of a flat swampy country, but slopes away somewhat gradually to the south and east, becoming more and more drift-covered. The vertical cross-section (Fig. II.) from northwest to southeast shows the exact position of the ore with relation to the serpentine and rhyolite. Unfortunately, drift covers the contact between these two rocks, except in three places, where pits have been blasted



out by the Canadian Copper Company, which held an option on the property. The ore is seen to be associated with the serpentine, rather than with the rhyolite, that is, it lies on the northwest side of the contact. The contact, itself, is quite sharp. Against the wall, there is roughly five feet of solid ore, which then passes imperceptibly into mixed ore and serpentine. This mixture continues for about four feet, with less of ore and more of serpentine to the edge of the swamp. At the south pit, however, very little pure ore is found against the foot wall, and the mixture (or pyrrhotite-serpentine rock) takes its place, being in turn succeeded by pure serpentine. A considerable quantity of good-looking ore has been taken from the pits, and three or four fair-sized dumps stand close by. On megascopic examination, the ore seems to be mainly pyrrhotite, with here and there a little chalcopyrite. The deposit, as revealed on the surface, is about 200 feet long.

In "Economic Geology," Vol. V., No. 4, 1910, a short account of the deposit is given by Dr. A. P. Coleman.[1] His conclusion as to the nature of the deposit is as follows:

[1] See also Vol. XVIII. (1909), Bur. Min., Ont., pp. 23-24.

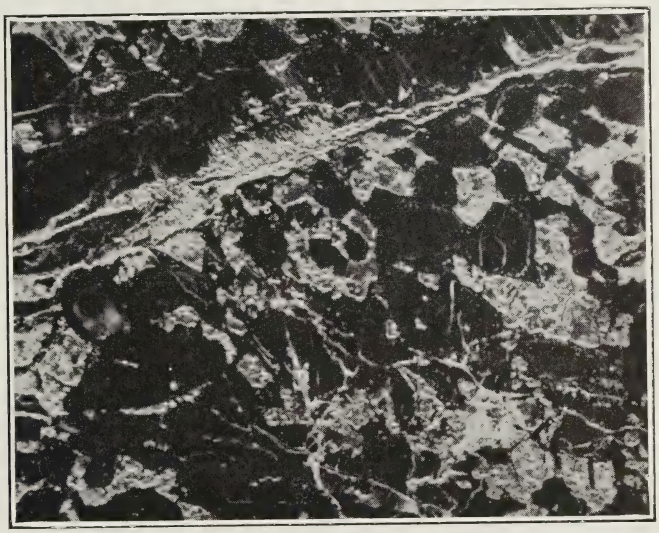
CLERGUE
GERMAN
DUNDONALD
T. and O. Ry.
Sand Plain
Wagon Road to Kelso
Watercourse
Road
LAKE
McINTOSH LAKE
HUNTER BRAZEAU
POOR PINE
LAKE
HOUSE
El. 894'
FREDERICK
Mag. Var. 8½° W. (1917)
LEGEND
DIABASE
KEEWATIN
FELSITE, RHYOLITE
SERPENTINE
HILL
ROAD
ALEXO MINE
NICKELIFEROUS PYRRHOTITE DEPOSIT
Scale of Miles
0
½
1
I
II
III
IV
1
2
3
4
5
6
7
8
9
10
11
12

"The general appearance of the ore and the arrangement of the ore body suggest strongly the marginal deposits of the Sudbury nickel range. There is every reason to suppose that the Alexo deposit has accumulated in the lower part of a bay-like curve of the country rock while the magma was still molten, as has been proved to be the case with the Sudbury marginal mines."

A detailed examination of numerous thin sections of the pyrrhotite-serpentine rock, taken from rich, lean, and barren spots, was made by the writer; and the results obtained, which are given below, lend considerable weight to the belief that, after all, the deposit is not one of the marginal segregation type, but rather of the replacement type. Polished surfaces of the pyrrhotite-serpentine rock are very similar to those of the augite-porphyrite of the Rossland camp, which has been partially replaced by pyrrhotite.

(1) There is a gradual transition in the amount of ore present, from solid ore against the wall, to pure serpentine ten or twelve feet away.

(2) Idiomorphic crystals of olivine, in nearly all cases completely altered to serpentine, appear to be floating in a matrix of pyrrhotite. The crystal outlines are sharp,



From photograph of polished surface of pyrrhotite—serpentine rock. A vein of asbestos is seen crossing the top of the picture. Ore, grey; serpentine, black.

and in many cases perfect, showing no evidences of rounded angles or edges, as might be expected if they had lived for a time in a previously differentiated molten mass of pyrrhotite.

(3) The ore, even in specimens taken from near the wall, shows black six-sided spots scattered abundantly through it, which were originally crystals of olivine, now completely transformed to magnetite. Examples like this seem to indicate pretty strongly that what is now ore was at one time a peridotite of the same nature as the rock about twelve feet from the contact.

(4) The ore is seen to be eating its way through the marix of the serpentine, extending from place to place in bunches of dust-like particles, and veinlike stringers, and eventually occupying all the space in the interstices of the crystals.

(5) The ore also extends from these interstices into fractures in the olivine crystals, finally replacing entire crystals and producing pseudomorphs.

(6) Sometimes the magnetite pseudomorphs, which have resulted from the alteration of the olivine, have become partially or wholly replaced by pyrrhotite.

(7) The serpentine is traversed by numerous veinlets of asbestos. These, of course, are much younger, as regards time of formation, than the rock itself. Nevertheless, in

none of the cases examined, was an asbestos vein seen to cut through particles of pyrrhotite. On the other hand, in nearly every case, small stringers of pyrrhotite run along the sides of the veins and send slender offshoots in between the fibres of the asbestos. This seems good proof that the ore is an infiltration of later date than the formation of the veins. It is also noteworthy that the rock is much richer in ore in the proximity of these asbestos veins, whose walls seem to have afforded channels for the depositing solutions.

(8) Ore is seen to be replacing the secondary pyroxenic material of the contact zone of the rhyolite, but has apparently no effect on the acidic constituents.

(9) Abundance of basic material in the serpentine and the almost total lack of it in the rhyolite, determined the position of the ore body, and accounts for the presence of a definite footwall, and only a commercial hanging-wall.

The Ore

Analyses of specimens gave an average determination for nickel of 7.08 per cent. This high percentage immediately suggested the presence of pentlandite. Surfaces of ore were polished and etched by immersion for half a minute in a boiling solution of HCl. (1:1). The pyrrhotite was, of course, etched, leaving in bold relief, octahedral crystals of magnetite, and delicate stringers and veins of a light bronze-coloured mineral, which proved on analysis to be pentlandite. Some specimens treated proved exceedingly rich in these veinlets, while others showed only traces. In all cases, however, the pentlandite was seen in the form of small stringers surrounding and even penetrating the grains of pyrrhotite. Chalcopyrite is present only in small amount. It is seen under the microscope in small lenticular masses, intimately associated with the pentlandite, and like it remaining unetched. The association is so close that the writer does not feel justified in drawing any conclusion as to their relative ages. The order of deposition which is apparent here is (1) magnetite; (2) pyrrhotite; (3) pentlandite and chalcopyrite. This is in close accordance with the results obtained by W. Campbell and C. W. Knight in their examination of specimens from other localities.[2]

The study of the ore specimens, therefore, tends to further substantiate the theory of replacement for the origin of the deposit. It is difficult to conceive of the sulphides as differentiations from a molten magma, when they were as a matter of fact deposited one after another, the younger occurring as veinlike masses in the older.

Conclusion

The above evidence seems to point without doubt to the origin of the ore-body by deposition from percolating sulphide waters. The source of the mineral-bearing solutions, and the genesis of the nickel content of the ore, it may be difficult to postulate, but two possible explanations are offered by the neighbouring rocks themselves—(1) the analysis of the serpentine shows the presence of small amounts of NiO (0.59 per cent.); (2) in the immediate vicinity are five exposures of a diabase rock, probably of post-middle Huronian age; and in Northern Ontario, the diabase almost without exception carries traces of nickel, as niccolite or cloanthite.

The Alexo Mine is one more example of the almost constant association of nickel ores with some kind of basic igneous rock.

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[2] Campbell & Knight: "On the Microstructure of Nickeliferous Pyrrhotites," Econ. Geol., Vol. II., No. 4 (1907), p. 350.



Photomicrograph of Alexo pyrrhotite-serpentine rock showing vein-like nature of the ore (black).



Porcupine, Government townsite, July, 1910.

ANNUAL REPORT

OF THE

Inspector of Division Courts

FOR THE

PROVINCE OF ONTARIO

FOR THE YEAR

1910

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
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1911.

Printed by
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29-37 Richmond Street West,
TORONTO.

To His Honour

COLONEL THE HONOURABLE J. M. GIBSON, K.C.,

Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to Your Honour the Report of the Inspector of Division Courts, of the Province of Ontario, for the year ending 31st December, 1910.

Respectfully submitted,

J. J. FOY,

Attorney-General.

Toronto, February 10th, 1911.

SIR,—I have the honour to submit herewith, to be presented to His Honour the Lieutenant-Governor, the Report of the Inspector of Division Courts, for the year ending 31st December, 1910.

I have the honour to be, Sir,

Your obedient servant,

J. B. MACDONALD,
Inspector.

To the Honourable J. J. FOY, K.C., M.P.P.,
Attorney-General, Toronto.

ANNUAL REPORT

OF THE

Inspector of Division Courts

FOR THE

Province of Ontario

FOR THE YEAR ENDING 31st DECEMBER, 1910.

TORONTO, FEBRUARY 10TH, 1911.

To His Honour Colonel The Honourable JOHN MORISON GIBSON, K.C.,
Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

I have the honour to submit the Annual Report upon the Division Courts of the Province for the year ending 31st December, 1910.

CONTENTS.

Table A.—Embraces a report of the business transacted in the Division Courts of the Province during the year.

These returns are tabulated under their respective headings for each court.

Table B.—Gives a complete list of the officers of the Courts and their post-office addresses.

Table C.—Gives similar information in respect to Bailiffs.

Table D.—Gives a description of the territorial boundaries of the different divisions, together with the names of the Judges and officers of the Crown, for the several Counties and Districts.

The Division Court Tariff of Fees will also be found in the last pages of the report.

During the year an additional court was created in Nipissing, going into effect 1st January, 1911, making nine courts for the District.

Since my last report, the Statutes, so far as Division Courts are concerned, have been revised, and copies of the Division Courts Act, in book form, have been placed in the hands of every Clerk and Bailiff in the Province. The appreciation of this action on the part of the Government is shown by the numerous letters received in the Department, attesting to the great help afforded them in discharging their duties.

The Division Court Tariff having also been revised, a copy was sent to each clerk, to be hung up in his office, as required by Section 47 of the Act. In respect to cases where the amount involved does not exceed $10.00, the Bailiff is now allowed the fee of 50 cents instead of 40 cents, for all services rendered by him up to judgment.

Inspection.

Considering that there are over 700 Division Court Clerks and Bailiffs, and 338 Division Court Offices in the Province, some idea may be formed of the work entailed in visiting and inspecting the courts. However, I am pleased to be able to state that a large precentage of the offices was inspected during the year. A report, showing the standing of each individual office visited, is kept on file in this Department.

In inspecting these offices special care has been taken to ascertain whether there are any "unclaimed moneys" remaining in court, with the result that a considerable amount has been paid over to the Clerks of the Peace, for Consolidated Revenue Fund, as required by Section 43.

A circular has been issued to Clerks and Bailiffs, calling their attention to the vital sections of both the Act and the Rules prevailing in the every-day transactions between them and the public doing business in their courts, and which I think will assist them materially in the proper discharge of their duties.

The business of the courts shows a slight decrease over the figures of the previous year. The total number of suits entered, exclusive of transcripts of judgment and judgment summonses, was 59,439, representing the sum of $2,125,455.01, as against 61,397 suits and $2,255,437.90 for the preceding year.

All of which is respectfully submitted.

I have the honour to be,

Your Honour's obedient servant,

J. B. Macdonald,

Inspector.

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed $100, exclusive of transcripts of judgments from other Courts.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	
Algoma	1	486	19,363 53	19	1,219 30	6	107 21	8,336 62	7,895 55	548 28	453
	2	49	2,013 31	2	190 98	4	....	1,250 53	1,250 53	....	45
	3	163	5,885 07	4	39 24	7	48 95	1,932 41	1,889 92	42 49	152
	6	57	2,537 09	2	38 86	2	.....	1,343 36	1,275 91	67 55	53
	7	243	7,710 09	4	194 61	10	554 56	3,970 17	4,210 94	313 79	238
Brant	1	701	26,279 59	32	1,621 69	47	149 84	10,366 51	10,083 93	432 42	658
	2	87	2,544 07	6	183 95	2	9 75	1,552 32	1,525 01	37 06	92
	3	82	2,109 01	5	569 83	6	.....	840 61	840 61	.....	78
	4	75	2,643 77	8	306 73	22	20 00	1,544 37	1,415 50	128 87	66
	5	25	837 68	2	66 80	.....	70	357 61	358 31	.....	24
Bruce	1	118	2,812 31	33	1,213 72	.....	.....	1,165 09	1,165 09	.....	116
	2	44	2,235 50	5	293 08	.....	28 37	1,289 23	1,251 23	38 00	39
	3	61	1,671 25	4	197 91	6	197 41	630 61	438 13	192 43	61
	4	45	2,033 32	2	72 88	.....	41 00	1,563 59	1,604 59	.....	34
	5	66	2,504 66	4	239 04	2	20 00	1,658 45	1,654 99	23 46	48
	6	12	576 53	.....	.....	.....	.....	119 18	109 18	10 00	11
	7	95	2,966 74	4	100 95	3	.....	915 46	915 46	.....	90
	8	199	7,273 30	14	995 27	28	10 85	2,650 84	2,624 85	25 99	189
	9	34	1,106 12	.....	198 71	2	1 60	912 66	852 66	61 60	34
	10	60	2,407 44	4	36 95	.....	35 26	368 50	318 76	85 00	51
	11	59	1,250 41	1	206 82	.....	.....	1,045 83	1,045 83	.....	29
	12	104	4,712 74	7	372 31	3	.....	926 56	926 56	.....	105
Carleton	1	2,142	85,863 45	50	2,442 54	509	1,108 67	17,828 41	18,154 79	782 29	1,977
	2	27	915 85	5	382 52	.....	.....	973 24	973 24	.....	26
	3	66	3,794 59	5	356 75	5	.....	2,211 06	2,211 06	.....	57
	4	21	822 21	1	59 19	.....	13 76	508 25	522 01	.....	20
	5	38	1,821 72	3	173 98	1	.....	719 70	669 70	50 00	33
	6	64	2,512 66	8	488 66	3	15 19	2,310 51	2,325 70	.....	58
	7	56	1,363 35	1	32 02	2	16 02	413 96	420 11	9 87	55
Dufferin	1	164	6,223 42	4	197 76	7	2 91	2,012 04	1,992 06	20 00	154
	2	126	4,965 23	8	392 22	11	301 94	1,963 69	1,998 54	267 07	118
	3	14	297 25	13	570 83	.....	... .	80 20	80 20	.....	14
	4	6	158 84	2	157 02	.....	....	226 02	226 02	.....	6
	5	84	3,646 35	10	335 00	7	.....	1,752 21	1,752 21	.....	78
Elgin	1	216	8,267 28	28	1,172 07	28	444 10	4,820 86	5,264 87	.....	178
	2	22	795 70	2	88 19	3	.....	365 93	365 93	.....	21
	3	995	28,928 51	33	1,623 29	100	.....	12,698 19	12,603 92	94 27	949
	4	91	3,060 76	13	1,128 52	6	13 00	1,964 98	1,964 98	13 00	93
Essex	1	53	770 75	.....	....	6	41 61	569 48	516 98	52 50	52
	2	151	4,142 66	13	618 35	33	101 12	1,862 04	1,907 08	56 06	177
	3	93	3,821 00	10	1,138 52	18	42 40	2,246 06	2,275 53	12 93	76
	4	57	2,652 62	9	850 20	17	43 84	1,362 47	1,399 59	6 72	55
	5	130	5,386 59	5	92 74	21	81 19	3,463 33	3,351 61	30 50	123
	6	43	1,467 89	7	364 40	.....	58 28	384 56	363 96	20 60	41
	7	571	18,216 16	48	476 10	243	105 24	9,851 00	9,324 07	526 93	412
	8	173	7,276 07	13	878 13	25	174 95	3,647 14	3,758 10	63 99	160
	9	33	1,681 61	6	622 76	1	65 13	1,744 18	1,707 45	101 86	27
	10	4	252 68	.....	.....	.....	5 00	226 01	228 47	2 52	.....

A.

to the 31st day of December, A.D. 1910, inclusive, shewing:

Number of suits entered where claim does not exceed $200.	Number of actions for tort, where the amount claimed does not exceed $60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed $100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of $60.	Number of suits entered for claims not exceeding $10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerks' returns of emoluments.	Bailiffs' returns of emoluments.	Unclaimed moneys in pursuance of section 43 D.C.A.
						$ c.		$ c.	$ c.		$ c.			$ c.	$ c.	$ c.
33	.....	.....	.....	70	.. ..	.....	....	.....	.....	3	15 00	.....	....	1,062 82	.....	.....
4	.....	.....	.....	10	.....	.....	....	.....	.....	.....	.....	.....	....	86 25	139 15	.....
11	.....	.....	.....	45	.....	.....	....	.....	.....	.....	.....	.....	....	269 30	133 39	.....
4	.....	.....	.....	7	1	6 00	....	.....	.....	1	5 00	.....	....	129 97	177 75	.....
5	.....	.....	.....	54	.. ..	.....	....	.....	.....	.....	.....	.....	....	511 15	241 60	.....
43	13	4	2	187	2	24 00	....	24 04	.....	4	20 00	4	....	1,354 85	678 39	.....
2	.....	.....	1	26	1	12 00	1	1 56	.....	1	20 00	2	....	181 10	101 17	.....
6	.....	.....	.....	26	1	12 00	....	1 98	.....	.....	.....	.....	....	131 85	58 12	.....
6	2	.....	3	15	2	24 00	....	2 82	.....	.....	.....	1	....	155 45	98 27	.....
1	.....	.....	.....	6	2	24 00	....	48	.....	.....	.....	.....	....	47 60	41 19	.....
2	1	.. ..	.....	41	1	11 00	....	1 88	.....	.....	....	.....	....	193 36	211 02	.....
5	.....	.....	.....	3	.....	.....	....	2 39	.....	.....	.....	.....	....	113 07	66 54	.....
1	.....	.....	.....	23	.....	.....	....	1 34	.....	.....	.....	.....	....	129 95	75 60	.....
4	.....	.....	.....	6	.....	.....	....	2 18	.....	.....	.....	.....	....	106 30	56 60	.....
6	.....	4	.....	7	1	12 00	....	27	.....	1	10 10	.....	....	150 40	117 00	.....
2	.....	.....	.....	2	.....	.....	....	71	.....	.....	.....	.....	....	24 45	21 45	. ....
5	.....	.....	.....	24	1	13 00	....	2 66	.....	.....	.....	.....	....	142 30	79 31	.....
11	3	1	.....	45	.....	.....	....	6 53	.....	1	5 00	4	....	495 80	336 09	.....
2	2	.....	.....	11	.....	.....	....	1 04	.....	.....	.....	.....	....	74 55	37 09	... ..
7	.....	.....	.....	17	.....	.....	....	2 74	.....	1	8 00	.....	....	103 10	.....	.....
3	.....	.....	.....	27	.....	.....	....	1 26	.. ..	.. ..	.....	... ..	....	109 70	48 72	.....
9	.....	.....	.....	50	.....	.....	....	4 38	.....	.....	.....	.....	....	229 30	.....	.....
148	4	.....	4	402	.....	.....	....	80 67	576 92	6	43 00	173	6	4.884 55	{ 1,217 59 { 1,046 27	.....
1	.....	.....	.....	3	.....	.....	....	98	.....	.....	.....	.....	....	64 30	31 00	.....
9	.....	.....	.....	3	.....	.....	....	4 15	.....	1	5 00	.....	....	157 22	155 04	.....
1	.....	.....	.....	5	.....	.....	....	67	.....	1	5 00	1	....	54 95	59 18	.....
5	.....	.....	.....	4	.....	.....	....	2 09	.....	.....	.....	.....	....	76 10	106 36	.....
6	.....	.....	.....	13	.....	.....	....	2 82	.....	.....	.....	.....	....	162 20	212 46	.....
1	.....	.....	1	20	.....	.....	....	91	.....	.....	.....	1	....	111 15	64 53	.....
10	2	.....	.....	34	1	7 00	....	5 77	.....	2	17 50	1	....	348 00	103 65	.....
8	1	.....	.....	11	.....	.....	....	4 73	.....	.....	.....	.....	....	269 18	236 42	.....
.....	.....	.....	.....	5	.....	.....	....	18	.....	.....	.....	.....	....	27 53	42 00	.....
.....	.....	3	.....	3	.....	.....	....	9	.....	.....	.....	.....	....	13 68	16 99	.....
5	.....	.....	1	14	1	11 00	....	2 43	.....	.....	.....	.....	....	205 40	86 40	.....
17	3	.....	.....	57	4	57 00	....	7 84	.....	1	10 00	8	....	641 15	486 06	.....
1	3	.....	1	2	2	24 00	....	70	.....	.....	.....	1	....	47 60	29 91	.....
47	2	1	2	331	2	12 00	....	21 20	.....	2	12 00	38	1	1,867 25	938 33	.....
4	1	.....	.....	27	.....	.....	....	2 65	.....	.....	.....	.....	....	177 54	299 33	.....
1	.....	.....	.....	28	.....	.....	....	1 03	.....	.....	.....	.....	....	103 49	69 97	
6	1	.....	.....	52	.....	.....	....	3 61	.....	2	15 00	2	....	382 35	175 99	.....
8	1	.....	2	7	.....	.....	....	4 00	.....	.....	.....	5	....	282 20	183 27	.....
1	1	.....	.....	11	.....	.....	....	1 36	.....	.....	.....	10	....	208 15	123 86	.....
7	2	.....	.....	36	.....	.....	....	3 97	.....	.....	.....	13	....	329 00	198 31	.....
2	5	.....	.....	12	.....	....	....	1 40	.....	.....	.....	.....	....	105 95	95 00	.....
12	1	.....	5	284	5	52 00	....	13 50	.....	4	40 00	66	....	1,992 10	{ 443 83 { 725 52	.....
13	.....	.....	.....	21	.....	.....	....	6 85	.....	.....	.....	2	....	442 15	249 54	.....
6	.....	.....	.....	3	.....	.....	....	2 01	.....	.....	.....	3	....	98 90	85 59	.....
.....	.....	.....	.....	.....	.....	.....	....	34	.....	.....	.....	.....	....	14 91	.....	.....

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed $100, exclusive of transcripts of judgments from other Courts.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	
Frontenac		801	22,454 93	21	1,072 93	124	71 41	8,199 73	8,143 53	127 59	763
	2	29	816 95	2	46 51	.....	51 89	458 55	439 24	71 20	28
	3	33	152 08	6	222 73	1	.....	457 58	457 58	.....	32
	4	102	3,173 99	7	156 91	7	12 00	976 29	988 29	.....	97
	5	36	1,229 54	3	116 41	6	.....	1,009 00	1,005 01	3 99	35
	6	67	2,970 53	3	150 10	2	.....	580 18	470 06	110 00	60
	7	49	1,475 17	3	42 69	4	33 91	698 49	655 31	77 09	48
Grey	1	579	16,766 30	15	669 51	60	70 00	6,270 91	6,330 91	.....	480
	2	171	6,670 21	18	722 65	4	31 58	4,888 35	4,882 37	37 56	153
	3	228	6,195 93	8	516 00	40	.....	2,495 80	2,495 80	.....	198
	4	42	1,471 71	9	1,256 03	13	.....	1,041 82	1,026 82	15 00	61
	5	130	4,491 56	18	1,286 78	11	75 51	2,767 72	2,612 17	155 55	123
	6	33	1,670 01	9	503 86	.....	.....	742 77	742 77	.....	26
	7	73	2,274 72	7	309 71	2	.....	1,211 76	1,211 76	.....	66
	8	65	2,434 54	1	69 88	14	137 29	524 05	634 84	30 50	62
Haldimand	1	43	1,864 34	2	116 79	7	50 64	1,067 66	1,087 92	30 38	47
	2	100	2,975 91	21	1,628 64	21	42 28	3,431 13	3,462 16	11 25	56
	3	198	5,066 64	8	317 29	44	267 86	1,921 03	1,978 53	210 36	193
	4	80	1,544 00	14	865 00	6	90 12	1,707 20	1,758 89	38 45	73
	5	9	264 43	2	47 00	.....	....	55 37	55 37	.....	6
Haliburton	1	45	1,441 98	6	209 70	.....	70 19	1,224 20	1,294 39	.....	44
	2	49	1,570 00	3	107 15	2	2 50	1,173 58	1,176 08	.....	44
	3	45	1,148 93	2	32 04	10	7 10	494 54	501 64	.....	14
	4	2	14 20	3	230 20	.....	.....	70 02	70 02	.....	2
Halton	1	151	4,867 93	2	53 02	16	345 56	2,323 39	2,506 87	62 08	143
	2	60	2,272 89	7	370 04	22	.....	888 29	874 44	13 85	52
	3	112	3,102 92	3	.....	5	35 02	477 87	418 89	58 98	47
	4	61	3,017 28	6	168 41	7	.....	1,250 03	1,250 03	.....	52
	5	33	809 81	9	835 54	5	.....	733 52	733 52	.....	37
	6	38	1,521 81	4	.....	2	19 10	588 47	604 32	3 25	35
Hastings	1	654	16,110 41	26	1,850 70	40	261 88	7,596 50	7,292 55	565 83	355
	2	51	2,332 75	7	402 70	2	55 42	1,339 20	1,266 69	127 93	48
	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	4	123	3,247 95	8	680 49	7	72 15	1,931 65	1,980 05	23 75	119
	5	87	2,247 12	7	303 84	16	22 69	900 34	893 43	29 60	102
	6	116	5,105 16	12	621 67	5	9 25	2,736 88	2,736 88	.....	102
	7	60	1,173 93	1	21 54	8	23 85	794 01	717 66	102 20	59
	9	307	8,923 97	12	492 82	17	58 50	3,702 30	3,723 58	37 22	288
	10	98	3,859 65	4	254 64	1	14 00	1,609 92	1,580 81	43 11	91
	11	43	1,700 30	5	211 62	.....	178 31	1,155 87	1,203 24	130 84	39
	12	103	3,584 62	8	237 94	7	111 98	1,959 56	1,774 97	184 59	98
Huron	1	190	5,331 14	23	988 05	6	81 92	2,350 00	2,259 04	172 88	119
	2	200	8,007 21	9	392 49	25	233 84	2,619 60	2,518 82	334 62	175
	3	97	4,192 89	7	461 49	6	15 68	817 15	820 27	12 76	95
	4	85	2,870 13	3	128 57	1	.....	889 36	877 36	12 00	69
	5	62	1,771 62	5	307 48	3	24 06	1,034 99	1,056 05	3 00	58
	6	20	787 62	3	60 39	2	....	581 23	581 23	.....	19
	7	21	866 20	3	55 97	.....	.....	282 25	259 85	22 40	18
	8	143	4,487 26	3	27 00	9	393 50	1,972 38	2,141 96	223 92	133
	9	39	1,084 66	6	172 39	4	.....	654 14	606 87	.....	38
	10	43	1,506 56	2	50 00	6	.....	484 84	484 84	.....	39
	11	27	910 26	.....	.....	.....	5 00	335 90	340 90	.....	26
	12	21	447 47	2	83 69	2	.....	430 53	430 53	.....	20

A.—Continued.

to the 31st day of December, A.D. 1910, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed $200.	Number of actions for tort, where the amount claimed does not exceed $60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed $100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of $60.	Number of suits entered for claims not exceeding $10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerks' returns of emoluments.	Bailiffs' return of emoluments.	Unclaimed moneys in pursuance of section 43, D.C.A.
						$ c.		$ c.	$ c.		$ c.			$ c.	$ c.	$ c.
38	1	.....	1	302	.....	.....	....	19 70	.....	2	10 00	24	....	1,566 50	{ 59 06 { 667 43	.....
1	.....	.....	.....	10	.....	.....	....	67	.....	.....	.....	.....	....	74 41	.....	.....
1	.....	.....	.....	10	.....	.....	....	1 28	.....	.....	.....	.....	....	82 10	68 63	.....
6	.....	.....	.....	30	.....	.....	....	2 91	.....	2	10 00	.....	....	191 45	185 44	.....
4	.....	.....	.....	11	.....	.....	....	1 42	.....	.....	.....	.....	....	63 66	69 59	3 99
7	.....	.....	.....	4	.....	.....	....	3 10	.....	.....	.....	.....	....	133 79	17 50	.....
1	1	.....	.....	6	.....	.....	....	1 09	.....	.....	.....	.....	....	97 64	70 24	.....
27	10	.....	1	197	1	11 00	....	15 63	.....	2	10 00	8	1	1,430 33	810 00	.....
14	1	1	1	21	.....	.....	....	2 77	.....	.....	.....	.....	....	467 70	416 54	.....
17	5	.....	.....	53	.....	.....	....	7 94	.....	3	20 00	3	....	544 95	312 19	.....
3	1	.....	1	7	.....	.....	....	1 47	.....	.....	.....	.....	....	142 41	183 40	.....
6	2	.....	.....	30	.....	.....	....	3 75	.....	.....	.....	1	....	324 75	348 35	.....
6	.....	.....	.....	8	.....	.....	....	1 98	.....	.....	.....	.....	....	82 55	111 74	.....
7	.....	.....	.....	23	.....	.....	....	2 38	.....	.....	.....	1	....	96 85	101 08	.....
3	2	.....	.....	13	.....	.....	....	2 16	.....	.....	.....	3	....	180 45	139 63	.....
3	3	.....	.....	7	1	12 00	....	1 86	.....	.....	.....	1	....	106 70	71 05	.....
6	1	.....	.....	39	1	12 00	....	2 94	.....	.....	.....	2	....	210 12	112 60	.....
5	1	.....	.....	89	.....	.....	....	3 98	.....	.....	.....	19	....	446 35	238 17	.....
1	1	.....	.....	19	1	10 00	....	1 87	.....	1	5 00	4	....	171 95	159 84	.....
3	.....	.....	.....	3	.....	.....	....	34	.....	1	10 00	.....	....	21 05	24 08	.....
.....	.....	.....	.....	6	.....	.....	....	1 12	.....	.....	.....	.....	....	*98 84	104 68	.....
5	1	.....	.....	15	.....	.....	....	1 73	.....	.....	.....	.....	....	160 30	58 02	.....
1	3	1	.....	11	.....	.....	....	1 03	.....	.....	.....	.....	....	106 90	108 90	.....
.....	.....	.....	.....	1	.....	.....	....	.....	.....	.....	.....	.....	....	9 13	70 12	.....
6	.....	.....	.....	50	.....	.....	....	4 13	.....	1	5 00	2	....	334 25	151 75	.....
6	.....	.....	.....	21	.....	.....	....	2 56	.....	.....	.....	1	1	60 41	29 93	.....
3	.....	.....	.....	40	1	12 00	....	.....	.....	.....	.....	.....	....	216 19	17 65	.....
7	.....	.....	.....	20	.....	.....	....	3 33	.....	.....	.....	3	1	189 90	.....	.....
7	.....	.....	.....	6	.....	.....	....	70	.....	.....	.....	.....	....	103 18	75 00	.....
3	.....	.....	.....	5	1	11 00	....	1 53	.....	.....	.....	.....	....	79 35	90 55	.....
20	10	.....	1	279	1	12 00	....	12 68	.....	.....	.....	.....	....	1,490 45	693 86	.....
3	.....	.....	.....	4	.....	.....	....	2 19	.....	.....	.....	.....	....	134 08	131 63	.....
.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	....	.....	.....	.....
4	4	.....	.....	29	1	12 00	....	3 02	.....	.....	.....	1	....	227 65	170 12	.....
.....	1	.....	.....	24	1	8 00	....	1 63	.....	.....	.....	1	....	205 10	96 75	.....
13	.....	.....	.....	28	.....	.....	....	5 39	.....	.....	.....	.....	....	223 65	390 56	.....
1	.....	.....	.....	31	.....	.....	....	88	.....	.....	.....	2	....	129 95	74 61	.....
19	1	.....	.....	102	.....	.....	....	8 98	.....	.....	.....	2	....	700 19	477 70	.....
7	.....	.....	.....	19	.....	.....	....	3 88	.....	.....	.....	.....	....	150 61	90 31	.....
4	.....	.....	.....	7	.....	.....	....	1 69	.....	.....	.....	.....	....	90 45	.....	.....
4	1	.....	.....	28	.....	.....	....	3 36	.....	.....	.....	.....	....	257 40	185 70	.....
8	2	.....	.....	61	2	24 00	....	4 50	.....	1	4 00	2	....	424 83	175 76	.....
25	.....	.....	.....	55	1	12 00	....	8 59	.....	.....	.....	5	....	442 00	188 89	.....
8	.....	.....	.....	11	1	12 00	....	4 01	.....	.....	.....	.....	....	206 90	13 04	.....
6	.....	.....	.....	24	.....	.....	1	2 86	.....	1	6 00	.....	....	196 75	95 43	.....
4	.....	.....	.....	18	.....	.....	....	1 81	.....	1	5 00	1	....	155 95	98 50	.....
2	.....	.....	.....	5	.....	.....	....	1 11	.....	1	3 00	1	....	57 26	38 10	.....
2	.....	.....	.....	6	.....	.....	....	12	.....	.....	.....	.....	....	25 05	.....	.....
10	3	.....	.....	49	1	12 00	....	4 51	.....	1	5 00	.....	....	298 00	178 23	.....
1	.....	.....	.....	14	.....	.....	....	76	.....	.....	.....	2	....	66 15	74 17	.....
4	.....	.....	.....	9	.....	.....	....	1 51	.....	1	7 00	.....	....	95 88	66 36	.....
1	.....	.....	.....	1	.....	.....	....	.....	.....	.....	.....	.....	....	47 72	36 23	.....
1	.....	.....	.....	6	.....	.....	....	55	.....	.....	.....	.....	....	49 51	34 00	.....

* Part of year.

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed $100, exclusive of transcripts of judgments from other Courts.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	
Kenora	1	343	33,280 30	3	116 17	4	1,276 84	3,280 18	1,863 69	1,416 49	322
	2	58	2,629 20	2	203 11	1	.....	920 21	898 66	21 35	52
Kent	1	690	22,484 00	25	1,823 24	183	1,369 51	7,862 04	7,742 49	1,489 06	533
	2	192	5,955 34	14	951 69	24	114 49	2,451 92	2,448 68	117 73	207
	3	33	662 27	8	264 67	2	57 95	486 36	503 51	40 80	33
	4	126	2,799 56	5	244 67	15	37 82	1,784 90	1,796 90	25 82	77
	5	222	6,297 76	37	1,847 13	22	582 43	3,641 83	4,090 78	133 48	214
	6	55	2,139 56	2	80 55	11	90 20	716 93	702 68	14 25	62
	7	224	9,987 20	7	339 06	3	48 63	4,262 25	4,290 29	20 59	207
Lambton	1	741	18,199 24	13	709 91	116	592 31	8,582 20	8,441 54	732 97	726
	2	73	3,584 42	5	583 21	5	23 85	1,636 49	1,635 24	25 25	49
	3	48	1,831 98	13	560 92	5	12 62	972 00	974 98	9 64	46
	4	66	3,246 88	9	229 29	16	.....	904 51	904 51	.....	57
	5	32	1,001 62	2	40 00	1	18 20	604 25	622 45	.....	.....
	6	10	413 43	3	208 48	.....	1 00	193 15	193 15	1 00	10
	7	25	770 66	4	195 58	.. ...	35 75	407 84	306 25	137 32	24
	8	156	5,954 50	15	757 95	21	25 32	1,916 47	1,903 73	38 06	149
	9	58	1,604 77	9	637 54	4	17 27	1,104 97	1,113 21	9 03	56
Lanark	1	158	4,616 60	12	739 45	15	58 31	1,773 03	1,803 29	28 05	150
	2	25	842 99	5	217 81	1	63 19	354 95	369 21	48 93	187
	3	169	4,662 90	1	....	26	83 20	1,855 36	1,921 06	17 50	399
	4	391	11,743 66	16	1,109 41	14	295 80	5,079 06	5,228 88	146 03	76
	5	84	2,960 33	5	418 47	7	.....	1,275 30	1,275 30	.....	.....
Leeds and Grenville	1	743	17,806 47	8	281 93	26	197 70	8,022 25	7,970 33	249 62	769
	2	142	3,176 10	10	685 06	27	1,171 93	1,615 50	1,777 01	203 25	138
	3	112	4,051 48	7	204 43	9	160 41	1,976 52	1,962 75	174 18	110
	4	100	3,702 41	5	318 59	10	111 33	2,055 87	1,993 84	173 36	90
	5	137	2,775 07	2	201 38	3	47 93	1,089 08	1,083 53	5 55	123
	6	138	4,721 37	3	323 31	10	82 49	1,781 04	1,752 88	28 49	123
	7	31	783 24	2	68 49	1	88 80	682 64	725 41	46 03	31
	8	132	5,410 67	11	706 81	14	.. ..	1,601 34	1,601 34	.. ..	121
	9	57	2,502 88	4	524 27	2	1 00	1,420 59	1,420 59	1 00	51
	10	25	688 59	3	163 24	.....	20 97	390 85	383 88	6 97	.....
	11	21	322 14	.....	.....	.....	.....	240 91	240 90	.....	21
	12	19	647 55	1	.....	.....	... .	338 80	338 80	.....	18
Lennox and Addington	1	131	3,725 44	9	241 76	17	57 43	1,402 41	1,442 40	17 44	140
	2	12	231 43	3	171 05	2	109 99	156 20	235 19	31 00	12
	3	9	191 38	.....	.....	1	.....	37 30	37 30	.....	10
	4	33	1,164 38	2	228 11	3	56 22	371 83	376 25	51 81	33
	5	64	3,859 51	6	111 92	5	18 57	1,369 79	1,377 03	11 33	33
	6	17	624 68	2	37 20	5	33 72	360 33	333 60	26 73	.....
	7	51	1,929 67	4	262 38	4	.....	1,244 00	1,162 27	81 73	46
	8	38	1,072 11	3	217 19	.....	6 00	711 97	638 50	79 37	37
	9	13	556 55	.....	....	.....	2 70	240 30	238 72	4 41	12

A.—Continued.

to the 31st day of December, A.D. 1910, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed $200.	Number of actions for tort, where the amount claimed does not exceed $60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed $100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of $60.	Number of suits entered for claims not exceeding $10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerks' returns of emolument.	Bailiff's returns of emoluments.	Unclaimed money in pursuance of section 43, D.C.A.
						$ c.		$ c.	$ c.		$ c.			$ c.	$ c.	$ c.
21	.....	.....	1	68	.....	.....	....	.....	.....	.....	.....	.....	....	987 69	326 68	.....
3	.....	.....	.....	3	.....	.....	....	.....	.....	.....	.....	.....	....	130 99	45 41	.....
37	3	.....	2	118	1	12 00	....	23 46	.....	2	15 00	52	4	1,475 05	475 05 475 92	..
8	3	.....	.....	60	2	24 00	...	5 43	.....	.....	.....	7	....	421 40	262 38	.. .
.....	.....	.....	.....	10	.....	.....	....	39	.....	.....	.....	1	....	86 25	73 65	.....
.....	.....	.....	.....	49	.....	.....	....	1 83	.....	.....	.....	1	....	256 90	134 36	...
8	3	.....	.....	75	1	11 00	....	5 24	.....	.....	.....	9	....	508 45	215 68	.....
6	1	.....	1	15	.....	.. ..	....	2 27	.....	.....	.....	3	...	138 15	110 91	.....
20	.....	.....	2	33	1	11 00	....	9 83	.....	2	10 00	.....	....	483 80	396 40	.....
15	6	.....	2	303	2	23 00	....	12 90	.....	1	5 00	.....	....	1,353 20	695 40	.....
7	.....	.....	1	.....	2	24 00	....	3 67	.....	.....	.....	.....	....	149 80	122 47	.....
2	.....	.....	1	7	.....	.....	....	.....	.....	.....	.....	.....	....	132 50	134 70	.....
10	.....	.....	.....	9	.....	.....	...	3 74	.....	.....	.....	12	....	144 10	163 97	.....
.. ...	.....	.....	.....	9	2	24 00	....	60	.....	.....	.....	1	....	48 50	38 18	.....
.....	.....	.....	.....	.....	.....	.....	....	24	.....	.....	.....	.....	....	24 68	27 11	.....
1	.....	.....	.....	4	.....	.....	....	64	.....	.....	.....	.....	....	49 50	52 10	.....
7	3	.....	.....	31	.....	.....	....	4 99	.....	.....	.....	.....	....	337 55	237 77	.....
2	.....	.....	.....	21	.....	.....	....	1 43	.....	.....	.....	.....	....	111 85	101 06	.....
6	4	.....	.....	53	.....	.....	...	4 37	.....	.....	.....	9	...	422 15	93 00 *110 05	....
..	.....	.....	.....	2	.....	.....	....	1 05	.....	.....	.....	.....	....	99 28	44 65	.....
8	.....	.....	.....	69	.....	.....	....	4 34	.....	1	5 00	7	....	383 90	23 90	... ..
21	.....	14	.....	124	.. ..	.....	....	10 20	.....	.....	.....	1	....	801 80	179 99 377 06	.....
8	.....	.....	.....	26	.....	.. ....	....	2 97	.....	.....	.. ..	1	....	178 80	170 30	.....
18	2	.....	.....	327	.....	.....	....	13 33	.....	.....	.....	2	....	1,291 13	170 08 349 11	.....
4	2	.....	.....	66	1	50	....	2 47	.....	1	5 00	3	....	285 50	241 20	.....
10	5	.....	3	27	.....	.....	....	4 03	.....	.....	.....	2	....	253 28	221 95	.....
10	.....	.....	.....	21	.....	.....	....	4 16	.....	.....	.....	.....	....	273 40	216 84	... ..
4	.....	.....	.....	66	.....	.....	....	2 23	.....	.....	.....	.....	....	217 75	100 85	.....
12	.....	.....	.....	36	.....	.....	....	5 10	.....	.....	.....	.....	....	327 70	286 67	.....
.....	.....	.....	.....	13	.....	.....	....	51	.....	.....	.....	.....	....	69 15	64 25	.....
8	4	.....	.....	2	.....	.....	....	5 15	.....	.....	.....	3	....	426 22	268 00	.....
8	.....	.....	.....	12	.....	.....	....	2 96	.....	.....	.....	.....	....	148 15	124 31	.....
.....	.....	.....	.....	7	.....	.....	....	39	.....	.....	.....	.....	....	51 63	43 88	.....
.....	.....	.....	.....	10	.....	.....	....	18	.....	.....	.....	.....	....	42 46	42 68	.....
2	9	.....	.....	7	.....	.....	....	80	.....	.....	.....	.....	....	34 70	36 82	.....
8	4	.....	.....	44	.....	.....	....	3 50	.....	2	15 00	9	1	276 60	174 14	.....
.....	1	.....	.....	6	.....	.....	....	12	.....	.....	.....	.....	....	29 93	.....	.....
.....	.....	.....	.....	5	.....	.....	....	6	.....	.....	.....	.....	....	17 01	15 71	.....
3	1	.....	.....	12	.....	.....	....	1 20	.....	.....	.....	.....	....	87 75	44 67	.....
15	.....	.....	.....	16	.....	.....	....	4 77	.....	.....	.....	2	....	159 55	155 49	.....
.....	.....	.....	.....	2	.....	.....	....	45	.....	.....	.....	.....	...	62 49	38 23	.....
5	1	.....	1	8	1	11 00	....	2 21	.....	.....	.....	.....	....	103 85	84 24	.....
1	1	.....	.....	13	.....	.....	....	90	.....	.....	.....	.....	....	86 56	93 61	.....
1	.....	.....	.....	2	.. ...	.....	....	.....	.....	.....	.....	.....	....	41 70	27 57	.....

* Part of year only.

TABLE

Return of Division Court business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed $100, exclusive of transcripts of judgments from other Courts.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	
Lincoln	1	31	1,467 05	4	245 56	1	.....	775 11	761 86	13 25	29
	2	534	14,141 16	14	795 63	69	223 15	6,473 23	6,509 05	187 33	521
	3	73	2,628 48	13	596 78	5	22 83	1,165 56	1,160 69	27 70	8
	4	16	752 10	11	1,016 64	2	24 84	594 05	604 89	14 00	13
	5	97	2,580 27	9	533 96	6	.....	706 52	696 52	10 00	98
Manitoulin	1	91	3,769 61	6	748 61	9	29 53	1,098 72	968 76	159 49	85
	2	61	1,710 53	10	814 31	7	5 07	1,154 27	1,142 68	16 66	68
	3	28	1,274 89	1	6 40	2	.....	181 25	181 25	.....	25
	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middlesex	1	1,971	69,757 55	30	1,497 32	107	664 93	23,424 14	23,527 10	561 97	1,435
	2	97	2,833 15	7	180 38	4	2 43	1,244 99	1,244 99	.....	45
	3	67	1,736 03	14	529 46	4	54 25	766 68	801 24	19 69	64
	4	38	1,236 09	27	1,221 44	4	.....	535 65	535 65	.....	37
	5	50	1,802 83	24	1,369 95	3	.....	1,242 51	1,178 97	63 54	46
	6	106	3,599 49	21	945 07	11	31 12	1,662 19	1,636 74	56 56	97
	7	84	1,417 74	5	198 92	.....	.....	1,042 61	1,042 61	.....	82
	8	12	277 45	5	193 80	1	14 00	167 75	176 75	5 00	12
	9	523	9,777 02	13	615 07	65	166 00	4,052 84	3,918 75	161 10	514
Muskoka	1	184	8,470 10	9	400 45	27	118 50	3,584 29	3,539 69	44 60	163
	2	75	3,273 46	15	761 78	4	87 57	3,010 50	2,947 91	100 16	69
	3	120	4,539 20	11	169 49	14	.....	1,716 39	1,657 29	16 00	115
	4	26	1,194 16	12	708 77	4	.....	454 38	454 38	.....	23
Nipissing	1	183	7,299 41	4	144 88	13	102 70	2,237 85	2,256 95	83 59	140
	2	58	2,162 77	7	440 27	2	25 60	1,970 80	1,931 80	39 00	53
	3	513	24,421 84	21	1,186 98	28	170 99	8,745 97	8,905 96	11 00	496
	4	235	14,463 91	15	1,507 49	6	.....	3,027 40	2,910 50	116 90	205
	5	32	1,138 34	1	42 18	4	9 00	750 83	714 06	45 77	28
	6	117	6,672 27	38	2,290 87	1	.....	1,335 41	1,325 44	10 00	96
	7	1,758	95,376 89	67	5,006 01	141	971 06	27,315 66	26,792 85	1,381 28	1,588
	8	240	12,614 04	18	.....	8	.....	3,570 10	3,285 29	284 81	197
	9	New Court		.....	.....	.....	.....	.....	.....	.....	.....
Norfolk	1	145	5,226 35	11	445 03	31	55 15	1,599 71	1,654 86	.....	140
	2	50	1,539 94	8	468 72	4	.....	604 31	566 36	37 95	50
	3	22	749 89	4	165 61	.....	.....	388 05	388 05	.....	22
	4	54	1,951 79	8	547 24	.....	114 44	602 00	495 44	221 00	52
	5	31	1,428 96	3	246 75	2	.....	724 80	724 80	.....	28
	6	103	3,586 12	12	542 10	45	.....	1,696 37	1,696 37	.....	98
	7	43	1,014 85	14	686 56	17	.....	963 07	963 07	.....	42
	8	35	856 42	5	424 19	.....	13 50	540 94	527 44	13 50	36
Northumberland and Durham	1	111	5,096 20	11	761 27	11	62 75	1,882 24	1,913 89	31 10	100
	2	43	1,856 94	3	194 90	3	40 43	918 96	934 93	24 46	40
	3	270	7,019 19	14	812 58	12	36 15	3,189 43	2,653 28	553 28	246
	4	79	2,720 46	5	321 86	5	179 74	754 46	842 38	91 82	66
	5	157	4,757 89	11	844 05	11	6 00	2,131 53	2,126 76	10 77	148
	6	32	879 87	.....	.....	1	.....	381 35	381 35	.....	30
	7	99	3,147 37	8	408 28	9	28 25	977 47	968 69	37 63	94
	8	105	3,426 76	3	87 47	35	8 00	1,461 07	1,361 45	107 62	135
	9	129	5,462 20	4	239 04	20	.....	2,872 20	2,872 20	.....	141
	10	40	784 18	19	929 75	4	.....	696 23	696 23	.....	40
	11	149	4,998 77	18	660 60	19	117 50	1,743 39	1,738 24	122 65	139

A.—Continued.

to the 31st day of December, A.D. 1910. inclusive, etc.—Continued.

Number of suits entered where claim does not exceed $200.	Number of actions for tort, where the amount claimed does not exceed $60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed $100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of $60.	Number of suits entered for claims not exceeding $10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of Jury Trials by Jurors called in pursuance of Section 142 D. C. A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerk's Returns of Emoluments.	Bailiff's Returns of Emoluments.	Unclaimed moneys in pursuance of section 43 D.C.A.
						$ c.		$ c.	$ c.		$ c.			$ c.	$ c.	
2	... ..	.....	1	6	.....	.....	....	1 16	.....	.....	.....	.....	....	75 65	.....	.....
12	... ..	.....	2	202	.....	.....	....	10 54	.....	3	19 00	2	....	1,048 50	546 83	.....
5	5	.....	2	16	.....	.....	....	2 54	.....	1	4 00	1	....	203 85	115 68	.....
3	6	.....	.....	.....	.....	.....	....	1 08	.....	1	10 00	.....	....	81 21	41 35	.....
4	.....	.....	.....	27	.....	.....	....	2 29	.....	.....	.....	.....	....	181 20	57 00	.....
5	.....	.....	.....	17	.....	.....	....	.....	.....	.....	.....	....	....	241 25	260 40	.....
... ..	.....	.....	2	19	... ..	.....	....	.....	.....	.....	.....	3	....	137 94	114 00	5 07
3	.....	.....	1	3	.....	.....	....	.....	.....	.....	.....	.....	....	65 88	.....	.....
.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	....	.....	.....	.....
136	11	.....	2	608	3	33 00	....	67 16	411 69	8	45 00	11	1	4,058 45	1,159 68	4 46
4	.....	.....	.....	59	.....	.....	....	2 68	.....	.....	.....	.....	....	164 16	157 25	.....
3	.....	.....	.....	24	.....	.....	....	1 65	.....	2	7 50	.....	....	153 77	94 75	.....
1	.....	.....	.....	6	1	12 00	....	88	.....	.....	.....	.....	....	122 28	120 94	.....
4	.....	.....	.....	7	1	12 00	....	1 84	.....	1	10 00	.....	....	138 80	152 90	.....
6	3	.....	.....	27	1	12 00	....	3 24	.....	.....	.....	.....	....	239 35	139 70	.....
2	.....	.....	.....	50	.....	.....	....	1 28	.....	.....	.....	.....	...	112 20	138 91	.....
.....	1	.....	.....	7	.....	.....	....	18	.....	.....	.....	.....	....	27 80	51 31	... ..
8	.....	.....	.....	41	2	17 00	....	6 99	.....	.....	.....	4	....	912 40	290 00	.....
22	1	.....	.....	32	.....	.....	....	.....	.....	.....	.....	3	....	449 64	217 12	.....
6	2	1	1	11	.....	.....	....	.....	.....	.....	.....	2	....	180 30	165 99	.....
10	.....	.....	.....	36	.....	.....	....	.....	.....	.....	.....	.....	....	225 00	182 76	.....
3	.....	.....	.... .	6	.....	.....	....	.....	.....	.....	.....	.....	....	81 55	..... .	.....
15	.....	.....	.....	28	.....	.....	....	.....	.....	.....	.....	2	....	419 80	202 47	.....
2	.....	.....	.. ....	12	.....	.....	....	.....	.....	.....	.....	.....	...	157 72	103 23	.....
45	3	.....	.....	70	.....	.....	....	.....	.....	5	18 00	5	1	1,449 00	560 66	5 50
35	1	.....	.....	14	.....	.....	....	.....	.....	.....	.....	1	....	575 35	422 55	.....
3	.....	.....	.....	4	.....	.....	....	.....	.....	1	5 00	.....	....	80 84	.....	.....
18	1	.....	.....	13	.....	.....	....	.....	.....	.....	.....	.....	....	279 72	279 07	.....
170	15	.....	.....	138	1	6 00	....	.....	558 92	.....	.....	46	1	4,794 60	3,275 60	.....
18	.....	.....	.....	25	.....	.....	....	.....	.....	.....	.....	1	....	613 16	.....	.....
.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	....	.....	.....	.....
13	.....	.....	.....	39	.....	.....	..	6 10	.....	.....	....	2	....	372 30	.....	.....
4	1	.....	.....	13	1	12 00	....	1 92	.....	.....	.....	1	....	119 35	119 55	.....
.....	1	.....	.....	4	1	12 00	....	57	.....	.....	.....	.....	....	49 62	37 60	.....
2	.....	.....	.....	13	.....	.....	.. .	1 61	.....	.....	.....	.....	....	94 70	106 50	.....
1	.....	.....	.....	7	.....	.....	....	1 35	.....	.....	.....	.....	....	76 05	68 96	.....
5	.....	.....	.....	21	1	12 00	....	3 11	.....	.....	.....	2	....	212 80	268 82	.....
1	.....	.....	1	16	.....	. . ....	....	1 00	.....	.....	.....	6	....	132 50	130 76	.....
1	.....	.....	.....	13	1	11 00	....	64	.....	...	.....	.....	....	57 55	32 69	.....
10	3	.....	1	20	2	24 00	....	4 97	.....	.....	.....	4	....	299 54	225 30	.....
3	.....	....	.....	4	.....	.....	....	1 89	.....	.....	.....	1	....	108 55	114 59	.....
45	.....	.....	.....	135	.....	.....	..	.....	.....	.....	.....	.....	...	.....	*76 87	.....
5	.....	.....	.....	18	.....	.... ..	....	2 48	.....	.....	.....	2	1	138 50	150 00	.....
9	.....	. ....	.....	49	.....	.....	....	4 47	.....	1	10 00	3	....	295 80	215 17	10 77
1	.....	.....	.....	12	.....	.....	....	76	.....	.....	.....	.....	....	60 89	87 50	.....
5	.....	.....	1	37	3	31 00	....	2 81	. ....	1	5 00	19	....	190 40	147 24	.....
5	.....	.....	.....	69	.....	.....	....	3 35	.....	1	5 00	5	....	261 97	170 05	... ..
10	1	.....	.....	21	.....	.....	....	5 51	.....	.....	.....	4	....	310 97	183 46	.....
.....	2	.....	.....	15	.....	.....	....	48	.....	.....	.....	2	....	136 40	110 80	.....
9	.....	.....	.....	40	.....	.....	....	4 83	. ...	.....	.....	9	...	321 55	164 48	.....

*Part of year only.

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed $100, exclusive of transcripts of judgments from other Courts.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	
Ontario	1	198	5,850 92	21	1,011 76	11	.....	2,832 79	2,745 97	86 82	183
	2	56	1,823 41	11	749 83	2	.....	815 73	815 73	.....	55
	3	40	1,316 10	1	40 00	2	.....	451 70	451 70	.....	36
	4	134	5,025 30	7	252 91	14	94 36	1,466 27	1,466 27	.....	101
	5	105	3,149 70	14	986 24	7	12 20	2,655 91	2,655 91	.....	75
	6	32	1,443 35	3	.....	.....	.....	549 74	549 74	.....	30
	7	20	646 73	5	274 93	3	4 00	278 19	255 01	23 18	20
Oxford.....	1	974	32,309 85	24	980 29	79	.....	18,299 70	18,119 19	180 51	712
	2	84	3,124 14	9	309 48	.....	42	1,910 07	1,910 49	.....	8
	3	67	1,250 04	8	482 53	12	.....	1,732 57	1,732 57	.....	23
	4	129	5,873 95	16	1,068 43	10	49 12	4,120 50	4,120 50	61 95	136
	5	321	10,757 63	20	857 43	14	19 87	4,845 07	4,845 07	263 38	297
	6	228	6,430 44	9	291 57	16	182 28	3,002 33	3,002 33	2 00	212
	7	50	2,315 22	11	697 64	.....	.....	1,328 51	1,328 51	2 99	42
Parry Sound ...	1	246	6,985 45	6	247 90	9	282 51	3,054 78	3,197 23	140 06	221
	2	11	567 85	1	74 74	1	.....	327 20	327 20	.....	9
	3	9	200 64	7	562 41	1	.....	202 36	202 36	.....	.....
	4	148	5,468 24	17	772 21	19	98 95	2,270 90	2,324 85	45 00	142
	5	37	1,050 19	2	75 62	1	.....	681 38	681 38	.....	35
	6	49	1,853 19	5	168 02	2	27 31	667 74	621 96	73 09	40
	7	64	2,391 83	13	553 70	11	41 28	1,149 57	1,021 45	128 12	60
Peel	1	86	4,262 74	9	487 60	16	97 62	1,140 45	1,217 07	21 00	74
	2	55	2,717 52	5	372 53	5	.....	1,206 49	1,188 95	17 54	48
	3	29	788 91	3	85 98	.....	.....	788 91	764 26	24 65	30
	4	51	2,513 61	3	270 93	1	.....	716 09	716 09	.....	44
Perth	1	522	18,651 10	39	1,338 94	93	103 45	6,803 81	6,805 50	101 76	513
	2	122	4,275 07	17	850 03	51	.....	2,077 10	2,077 10	.....	112
	3	191	7,208 26	12	526 87	28	7 55	3,663 03	3,663 03	4 55	179
	4	14	360 46	.....	.....	2	.....	174 36	174 36	.....	15
	5	56	2,283 65	7	560 77	4	.....	934 18	934 13	.....	51
	6	167	6,228 41	12	63 47	28	.....	3,502 28	3,502 28	.....	156
Peterborough....	1	523	16,663 18	24	909 70	67	.....	6,871 32	6,815 04	56 28	496
	2	92	2,121 19	4	190 52	.....	160 12	2,190 51	2,232 01	118 62	82
	3	61	1,413 45	1	49 82	2	84 68	672 12	731 15	25 65	61
	4	7	189 21	4	79 42	.....	.....	69 72	69 72	.....	6
	5	135	3,454 67	12	502 24	4	.....	1,213 63	1,180 63	30 00	84
	6	4	98 43	.....	.....	.....	.....	105 93	105 93	.....	4
Prescott and Russell	1	56	838 78	5	275 16	5	.....	195 48	195 48	.....	56
	2	48	1,387 70	1	790 00	3	.....	738 75	738 75	.....	3
	3	25	862 00	.....	.....	.....	40 00	545 95	585 95	.....	24
	4	93	3,131 65	2	98 17	9	.....	1,433 24	1,433 24	.....	85
	5	28	1,354 06	5	72 69	.....	.....	634 00	634 00	.....	24
	6	65	3,997 38	7	547 77	2	.....	2,301 56	2,301 56	.....	.....
	7	220	5,604 84	.....	.....	40	.....	1,366 50	1,366 50	.....	13
	8	Vacant	.....	.....	.....	.....	.....	.....	.....	.....	.....
	9	36	1,628 21	.....	.....	3	6 98	459 10	463 08	3 00	34
	10	132	4,715 75	1	25 58	11	17 00	2,399 02	2,387 02	29 00	122
	11	100	3,700 52	8	404 88	4	.....	1,830 16	1,823 85	6 91	93

A.—Continued.

to the 31st day of December, A.D. 1910, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed $200.	Number of actions for tort, where the amount claimed does not exceed $60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed $100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of $60.	Number of suits entered for claims not exceeding $10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of Jury Trials by Jurors called in pursuance of Section 142, D. C. A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerk's returns of emoluments.	Bailiff's returns of emoluments.	Unclaimed moneys in pursuance of Section 43, D. C. A.
						$ c.		$ c.	$ c.		$ c.			$ c.	$ c.	
11	.....	.....	1	61	.....	.....	....	6 28	.....	3	15 00	2	....	420 55	421 37	.....
1	.....	.....	.....	6	.....	.....	....	1 39	.....	.....	.....	.....	....	131 40	133 22	.....
4	.....	.....	.....	6	.....	.....	....	1 63	.....	.....	.....	1	....	83 15	106 70	.....
8	.....	.....	2	24	4	48 00	....	4 70	.....	.....	.....	.....	....	304 78	229 93	...
6	1	.....	.....	8	.....	.....	....	3 10	.....	.....	5 00	.....	....	205 12	196 36	.....
2	.....	.....	.....	.....	.....	.....	....	1 10	.....	1	5 00	.....	....	73 09	21 46	....
.....	.....	.....	.....	4	1	12 00	1	45	.....	1	.....	2	....	55 55	64 54	.....
71	1	.....	.....	401	1	14 10	2	29 48	.....	3	15 00	3	....	1,894 34	1,017 09	.....
7	.....	.....	.....	20	.....	.....	....	30	.....	1	5 00	.....	....	156 05	157 78	.....
2	27	.....	.....	14	1	12 00	1	2 69	.....	.....	.....	1	1	116 75	135 00	....
24	1	.....	.....	28	.....	.....	1	6 85	.....	.....	.....	1	....	303 88	273 19	.....
21	.....	.....	.....	99	1	12 00	....	10 80	.....	.....	.....	5	....	722 75	405 01	.....
16	.....	.....	.....	64	1	12 00	....	7 42	.....	.....	.....	3	....	415 45	247 97	.....
7	.....	.....	.....	12	.....	.....	....	2 59	.....	.....	.....	.....	....	98 94	74 32	.....
4	3	.....	3	43	.....	.....	....	.....	.....	.....	.....	.....	....	497 85	269 05	.....
2	1	.....	.....	3	.....	.....	....	.....	.....	.....	.....	.....	....	33 35	.....	.....
.....	.....	.....	.....	1	.....	.....	....	.....	.....	.....	.....	.....	....	22 40	51 43	.....
5	.....	.....	.....	34	.....	.....	....	.....	.....	.....	.....	.....	....	392 45	.....	.....
2	.....	.....	.....	7	.....	.....	....	.....	.....	.....	.....	.....	....	73 62	99 43	.....
6	.....	.....	.....	3	.....	.....	....	.....	.....	.....	.....	.....	....	91 83	145 45	.....
4	.....	.....	.....	10	.....	.....	....	.....	.....	.....	.....	.....	....	155 87	135 68	.....
12	.....	.....	.....	18	3	33 00	....	5 12	.....	2	18 00	2	....	229 15	135 24	.....
6	3	.....	.....	6	1	12 00	....	2 70	.....	.....	.....	.....	....	127 68	81 79	.....
.....	.....	.....	.....	6	.....	.....	....	42	.....	.....	.....	1	...	53 34	*71 30	.....
6	1	.....	.....	10	.....	.....	....	2 95	.....	.....	.....	.....	....	109 80	84 26	.....
32	.....	.....	1	147	1	11 00	....	18 06	.....	3	16 00	18	5	1,288 70	761 40	.....
10	.....	.....	.....	32	.....	.....	...	4 33	.....	.....	.....	13	....	650 12	260 51	.....
11	1	.....	.....	44	.....	.....	....	7 59	.....	.....	.....	9	....	422 35	251 98	.....
.....	.....	.....	.....	8	.....	.....	....	15	.....	.....	.....	.....	....	33 25	3 75	.....
5	.....	.....	.....	10	1	11 00	1	2 12	.....	.....	.....	1	1	122 49	103 44	.....
11	.....	.....	.....	55	2	23 00	....	6 17	.....	1	5 00	10	....	407 75	107 90	.....
24	3	.....	1	143	1	12 00	....	14 92	.....	3	20 00	26	3	1,171 55	623 04	.....
9	.....	.....	.....	19	.....	.....	....	3 97	.....	.....	.....	.....	....	213 48	.....	.....
.....	1	.....	.....	25	1	12 00	....	90	.....	.....	.....	.....	....	124 85	61 36	.....
1	.....	.....	.....	4	.....	.....	....	31	.....	.....	.....	.....	....	20 70	.....	.....
4	.....	.....	.....	48	.....	.....	....	3 01	.....	.....	.....	1	....	257 41	168 81	.....
.....	.....	.....	.....	.....	.....	.....	....	09	.....	.....	.....	.....	....	4 92	2 58	.....
.....	.....	.....	.....	25	.....	.....	....	45	.....	.....	.....	3	....	115 26	51 09	.....
3	.....	.....	.....	18	1	11 00	....	1 44	.....	.....	.....	3	....	93 19	49 17	.....
1	.....	.....	.....	5	1	11 00	....	70	.....	.....	.....	.....	....	51 15	41 95	.....
8	.....	.....	.....	28	.....	.....	....	3 26	.....	.....	.....	2	1	252 94	137 74	.....
4	.....	.....	.....	4	.....	.....	....	1 72	.....	.....	.....	.....	....	63 80	.....	.....
1	.....	.....	1	6	.....	.....	....	2 42	.....	2	8 00	1	....	129 79	104 40	.....
8	.....	.....	.....	84	.....	.....	....	9 89	.....	.....	.....	5	3	459 65	186 93	.....
.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	....	.....	34 20	.....
2	3	.....	.....	5	.....	.....	....	1 58	.....	1	3 00	.....	....	88 05	66 53	....
10	.....	.....	.....	22	.....	.....	....	4 48	.....	.....	.....	4	....	275 45	164 35	.....
7	.....	.....	.....	22	.....	.....	....	3 40	.....	.....	.....	1	....	208 86	204 55	.....

* Part of year only.

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed $100, exclusive of transcripts of judgments from other Courts.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	
Prince Edward..	1	512	5,438 13	2	66 48	353	781 82	4,814 20	4,849 08	746 94	861
	2	6	304 75	.....	.....	8	.....	32 10	32 10	.....	5
	3	4	131 70	.....	.....	.....	.....	120 89	120 89	.....	4
	4	9	371 42	5	242 42	3	15 20	150 02	150 02	.....	9
	5	59	1,394 56	3	333 64	4	.....	526 04	531 54	9 70	5
	6	9	248 19	.....	.....	2	.....	90 19	71 41	18 75	9
	7	24	1,174 02	2	35 23	1	.....	505 93	473 35	32 58	23
	8	3	57 83	.....	.....	.....	.....	15 63	15 63	.....	3
Rainy River	1	124	6,186 64	4	210 79	5	124 30	2,241 04	2,126 06	239 28	111
	2	81	2,274 24	3	159 68	1	55 30	1,177 90	1,147 63	30 27	61
	3	80	5,008 57	.....	.....	1	112 12	1,866 76	1,809 98	66 80	71
Renfrew	1	324	11,962 37	9	500 16	28	92 00	3,104 02	2,896 86	207 16	329
	2	23	759 09	2	445 23	3	7 00	245 26	241 76	10 50	22
	3	210	8,959 77	17	1,137 72	12	12 06	4,322 53	4,309 88	24 71	193
	4	209	6,105 70	12	554 45	18	294 24	2,440 95	2,445 02	280 17	202
	5	132	3,434 05	3	254 00	2	.....	3,434 05	3,434 05	.....	37
	6	94	3,031 08	3	236 57	3	10 91	1,585 91	1,587 83	8 99	89
	7	114	4,534 24	6	338 06	1	18 85	1,819 02	1,741 09	96 78	99
Simcoe.....	1	436	14,758 76	19	1,630 71	56	49 11	6,151 05	6,131 43	68 73	413
	2	116	3,652 26	55	173 95	16	93 81	1,634 62	1,622 51	105 92	113
	3	100	4,458 86	16	702 84	6	172 00	2,056 66	2,172 20	56 46	69
	4	216	6,004 32	23	1,651 71	11	191 58	3,407 96	3,464 16	135 38	204
	5	53	1,982 17	4	285 52	10	69 82	986 93	1,019 75	37 00	50
	6	255	7,652 02	13	967 98	31	124 73	2,893 93	2,769 20	167 13	235
	7	26	1,353 88	6	388 54	1	5 27	295 52	285 25	10 27	21
	8	104	4,016 06	17	1,039 98	16	101 42	1,782 49	1,881 46	2 45	97
	9	326	10,984 93	14	922 56	42	120 36	5,049 63	5,051 86	118 13	303
	10	201	7,219 31	12	525 71	23	23 19	3,016 00	2,343 51	695 68	141
Stormont, Dundas and Glengarry	1	73	3,222 18	7	363 07	7	12 00	1,293 86	1,278 86	15 00	62
	2	210	5,960 44	4	.....	20	89 98	1,327 28	1,287 01	40 01	198
	3	424	12,237 28	7	328 88	132	179 00	4,610 33	4,482 86	127 97	409
	4	81	1,746 01	4	140 14	11	.....	1,201 42	1,117 37	84 05	78
	5	84	2,651 99	7	321 20	20	360 75	936 80	1,063 91	233 64	79
	6	55	1,319 45	2	62 75	2	28 00	653 70	665 60	16 15	51
	7	77	2,544 75	2	176 87	3	23 19	1,829 07	1,828 07	24 15	75
	8	150	5,190 43	15	793 82	8	104 52	2,731 54	2,724 53	111 53	104
	9	62	1,442 35	1	152 06	.....	.....	763 45	763 45	.....	55
	10	145	5,959 71	7	208 61	5	92 68	4,320 94	4,223 98	189 64	90
	11	74	2,846 62	9	396 40	11	19 90	1,930 00	1,937 64	12 26	67
	12	98	4,248 56	2	35 94	15	81 99	2,110 26	2,187 23	5 02	96
Sudbury	1	691	30,473 00	21	765 00	16	841 12	13,278 66	12,798 15	1,321 63	549
	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	3	165	3,974 27	5	194 36	10	145 75	2,286 74	2,029 98	402 51	156
	4	63	3,115 63	3	90 39	.....	.....	654 62	654 62	.....	59
Thunder Bay....	1	836	41,264 83	30	1,420 30	58	26 20	14,193 46	13,823 84	269 52	639
	3	1,017	45,517 39	38	3,255 32	43	773 21	16,077 71	16,227 50	623 44	762

A.—Continued.

to the 31st day of December, A.D. 1910, inclusive, etc.—Continued.

Number of suits entered where claim does not exceed $200.	Number of actions for tort, where the amount claimed does not exceed $60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed $100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of $60.	Number of suits entered for claims not exceeding $10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerks' returns of emoluments.	Bailiffs' returns of emoluments.	Unclaimed moneys in pursuance of section 43, D.C.A.
						$ c.		$ c.	$ c.		$ c.			$ c.	$ c.	$ c.
6	5	.....	.....	415	.....	.....	....	3 29	.....	.....	.....	12	....	1,319 80	622 30	.....
1	.....	1	.....	2	.....	.....	....	31	.....	.....	.....	.....	....	27 38	14 35	.....
.....	1	.....	.....	.....	.....	.....	....	9	.....	.....	.....	.....	....	11 15	12 21	.....
.....	.....	.....	.....	.....	.....	.....	....	27	.....	.....	.....	.....	....	45 17	18 59	.....
3	29	.....	.....	26	.....	.....	....	1 59	.....	.....	.....	2	....	125 02	.....	.....
.....	.....	.....	.....	4	.....	.....	....	18	.....	.....	.....	.....	....	25 95	12 18	.....
1	.....	.....	.....	4	.....	.....	....	1 00	.....	.....	.....	.....	....	53 95	34 50	.....
.....	.....	.....	.....	1	.....	.....	....	6	.....	.....	.....	.....	....	7 83	4 71	.....
13	.....	.....	.....	10	.....	.....	....	.....	.....	.....	.....	1	....	299 10	.....	.....
1	.....	.....	.....	19	.....	.....	....	.....	.....	1	10 00	.....	....	172 76	108 59	.....
9	.....	.....	.....	4	.....	.....	....	.....	.....	.....	.....	.....	....	148 45	68 70	.....
21	.....	3	.....	78	.....	.....	....	8 83	.....	3	15 00	9	2	616 25	293 50	.....
1	.....	.....	.....	4	.....	.....	....	70	.....	.....	.....	.....	....	53 00	42 73	.....
19	2	.....	.....	.....	.....	.....	....	9 25	.....	.....	.....	.....	....	489 75	261 18	.....
7	.....	1	.....	66	.....	.....	....	4 42	.....	1	10 00	2	....	499 70	195 16	.....
6	1	3	.....	31	.....	.....	....	3 94	.....	.....	.....	.....	....	266 94	276 71	.....
5	.....	.....	.....	21	.....	.....	....	2 96	.....	.....	.....	.....	....	41 02	11 76	.....
9	.....	.....	.....	15	.....	.....	....	5 13	.....	2	20 00	.....	....	245 38	267 06	.....
23	.....	.....	.....	122	2	21 00	...	13 22	.....	1	10 00	17	....	1,068 30	277 55	.....
2	.....	.....	.....	41	1	24 00	....	3 18	.....	.....	.....	3	....	265 15	135 09	.....
10	.....	.....	.....	21	1	12 00	1	4 75	.....	.....	.....	2	1	221 55	240 57	.....
8	7	.....	2	56	2	24 00	....	5 93	.....	1	7 00	3	....	453 85	352 32	.....
3	4	.....	.....	6	1	11 00	....	1 86	.....	1	10 00	3	....	111 10	127 86	.....
18	.....	.....	2	89	1	10 00	....	7 68	.....	1	5 00	6	....	560 50	285 83	.....
5	.....	.....	.....	3	.....	.....	....	1 73	.....	.....	.....	3	....	77 90	106 14	.....
7	4	.....	.....	22	1	12 00	....	4 10	.....	.....	.....	1	....	257 30	164 37	.....
17	1	.....	.....	83	.....	.....	....	9 98	.....	1	5 00	27	....	763 35	478 80	.....
11	.....	.....	.....	49	.....	.....	....	6 26	.....	.....	.....	.....	....	379 95	309 47	.....
8	.....	.....	.....	13	.....	.....	....	3 57	.....	.....	.....	1	1	117 65	123 17	.....
10	.....	.....	.....	49	.....	.....	....	3 89	.....	.....	.....	1	.	438 86	109 19	.....
15	10	.....	2	150	.....	.....	....	10 14	.....	.....	.....	19	2	1,059 50	566 09	.....
1	.....	.....	.....	43	.....	.....	....	1 35	.....	.....	.....	2	....	182 75	192 84	.....
5	75	.....	.....	23	.....	.....	....	2 23	.....	.....	.....	2	....	224 60	161 27	.....
2	.....	.....	.....	16	.....	.....	....	1 10	.....	.....	.....	.....	....	175 50	67 75	.....
2	1	.....	.....	21	.....	.....	....	1 82	.....	.....	.....	.....	....	172 35	130 19	.....
11	.....	.....	.....	34	.....	.....	....	.....	.....	.....	.....	.....	....	301 90	169 53	.....
2	.....	.....	.....	20	.....	.....	....	1 25	.....	.....	.....	.....	....	101 76	99 27	.....
17	4	.....	.....	33	.....	.....	....	6 98	.....	2	18 00	1	....	309 60	235 82	.....
7	.....	.....	.....	17	.....	.....	....	2 77	.....	2	9 00	2	1	166 49	200 65	.....
8	.....	.....	.....	14	.....	.....	....	4 22	.....	1	7 00	1	....	201 85	173 82	.....
46	1	.....	.....	95	.....	.....	....	.....	.....	.....	.....	2	....	1,265 16	1,349 31	.....
.....	.....	.....	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	....	.....	.....	.....
9	.....	2	.....	20	.....	.....	....	.....	.....	.....	.....	.....	....	341 85	.....	.....
4	.....	.....	.....	3	.....	.....	....	.....	.....	1	5 00	.....	....	133 00	131 07	.....
96	.....	.....	.....	101	.....	.....	....	.....	.....	.....	.....	4	1	1,899 56	693 25	.....
102	9	.....	2	142	2	12 00	1	.....	.....	5	52 00	3	2	1,539 96	1,176 63	.....

TABLE

Return of Division Court Business from the 1st day of January

Name of County, United Counties, or District.	Number of Divisions.	Number of suits entered exclusive of transcripts of judgments and judgment summonses.	Amount of claims entered exclusive of transcripts of judgments and judgment summonses.	Number of transcripts of judgments received from other Courts.	Amount of claims received by transcripts of judgments from other Courts.	Number of judgment summonses issued.	Balance of cash in Court from the previous year.	Total amount of suitors' money paid into Court.	Total amount of suitors' money paid out of Court.	Balance of cash in Court.	Number of suits entered where the amount claimed does not exceed $100, exclusive of transcripts of judgments from other Courts.
			$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	
Victoria	1	30	1,768 28	6	313 72	.....	.....	860 84	860 84	.....	22
	2	50	1,737 71	6	217 21	5	.....	966 45	966 45	.....	54
	3	47	1,451 24	3	178 32	4	25 00	861 42	861 42	24 76	50
	4	18	1,206 97	3	356 09	.....	.....	862 15	862 51	.....	10
	5	377	13,663 66	11	604 25	33	46 44	5,006 29	5,028 13	24 70	356
	6	28	973 99	1	17 89	2	3 75	560 83	560 83	3 75	25
	7	27	821 53	4	329 08	1	15 46	404 34	419 80	4 29	26
Waterloo	1	543	19,564 10	24	1,231 64	100	56 16	7,886 29	7,820 63	65 66	621
	2	159	3,580 45	6	666 32	15	75 79	1,766 85	1,662 71	104 14	153
	3	458	12,462 96	29	1,735 04	82	....	7,244 59	7,242 59	2 00	440
	4	87	3,325 5	3	36 79	13	101 88	1,083 70	941 91	243 67	79
	5	43	1,773 96	8	556 55	3	.....	981 04	968 96	12 08	38
	6	54	2,462 57	.....	....	2	.....	561 68	561 68	.....	47
	7	23	648 53	2	198 09	.....	16 63	446 88	460 51	3 20	22
Welland	1	518	16,762 83	28	1,876 82	47	56 77	7,957 99	7,755 30	259 46	389
	2	34	1,180 89	5	306 59	4	8 04	880 37	888 41	.....	32
	3	144	5,381 38	11	621 41	10	47 10	2,359 70	2,373 75	33 05	135
	4	345	9,891 01	21	1,104 85	35	903 37	4,951 06	4,875 42	979 01	361
	5	38	1,052 83	1	16 36	.....	31 90	731 47	654 74	108 63	36
	6	68	1,288 99	4	70 76	.....	.....	1,359 75	1,359 75	.....	61
Wellington	1	896	22,099 27	24	1,029 43	106	55 72	9,082 36	9,015 25	122 83	420
	2	7	361 20	2	180 08	2	.....	69 88	69 88	.....	6
	3	17	531 45	3	83 68	.....	.....	297 28	297 28	.....	17
	4	39	1,779 00	4	113 81	7	35 37	981 35	955 95	60 77	34
	5	36	1,074 72	4	257 90	1	.....	854 21	854 21	.....	29
	6	35	1,355 07	5	272 93	2	52 54	454 58	477 37	29 75	33
	7	92	2,902 59	20	1,357 34	4	.....	1,793 73	1,778 73	15 00	91
	8	85	3,422 85	16	1,051 72	9	5 50	1,766 58	1,746 83	25 25	82
	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	11	68	2,299 52	9	1,097 45	4	73 09	1,236 19	1,191 39	117 89	65
Wentworth	1	1,090	41,425 74	28	1,255 61	58	570 74	10,345 84	10,572 84	343 74	939
	2	137	4,998 29	10	559 55	4	.....	1,728 32	1,728 32	.....	133
	3	19	1,080 72	2	37 97	1	8 40	667 92	667 32	.....	17
	4	48	1,522 45	6	213 40	2	4 91	856 80	859 71	2 00	46
	5	51	1,779 62	4	17 45	6	.....	880 85	880 85	.....	46
	7	3	116 90	1	60 57	.....	.....	97 57	97 57	.....	3
	8	5	359 97	.....	.....	.....	.....	.....	.....	.....	.....
	9	1,148	33,334 39	20	1,475 07	47	266 14	12,952 10	13,002 22	216 02	1,087
York	1	3,419	165,307 63	103	6,034 72	490	662 24	34,627 41	34,548 82	740 83	3,125
	2	116	5,856 19	6	805 42	5	.....	2,761 40	2,761 40	.....	97
	3	58	2,243 09	3	257 74	5	.....	1,344 42	1,210 42	134 00	56
	4	217	7,743 64	26	949 36	21	85 41	3,263 53	3,221 69	127 25	201
	5	63	3,020 24	9	476 96	2	65 47	967 61	1,017 78	15 30	57
	6	109	5,323 85	9	.....	8	.....	.....	.....	.....	98
	7	33	1,745 18	1	24 19	6	3 00	790 39	732 39	61 00	36
	8	495	17,347 24	18	1,281 10	77	151 33	7,344 65	7,332 29	163 69	465
	9	41	1,690 52	3	133 35	16	63 00	931 48	918 98	75 50	37
	10	3,576	157,786 63	74	4,612 81	463	1,534 30	37,381 95	36,948 57	1,967 68	3,233
Totals	338	59,439	2,125,455 01	3,014	166,088 38	6,387	28,634 76	817,736 84	807,152 77	31,628 39	51,914

A.—Concluded.

to the 31st day of December, A.D. 1910, inclusive, etc.—Concluded.

Number of suits entered where claim does not exceed $200.	Number of actions for tort, where the amount claimed does not exceed $60.	Number of personal actions, where the parties consent thereto in writing and the amount claimed does not exceed $100.	Number of actions of replevin, where the value of the goods or other property or effects distrained, taken or detained, does not exceed the sum of $60.	Number of suits entered for claims not exceeding $10.	Number of jury trials by juries summoned.	Amount paid to jurors summoned.	Number of jury trials by jurors called in pursuance of section 142, D.C.A.	Amount payable to County Treasurer for "Division Court Jury Fee Fund."	Amount of fees and emoluments payable to the Honourable the Treasurer for the use of the Province.	Number of instances in which the Judge has allowed costs to be taxed for Counsel, Attorney or Agents' fees.	The amount of costs so taxed.	Return of judgment debtors ordered to be committed.	The number of such debtors actually committed.	Clerks' returns of emoluments.	Bailiffs' returns of emoluments.	Unclaimed moneys in pursuance of Section 43, D. C. A.
						$ c.		$ c.			$ c.			$ c.	$ c.	
6				2				2 19						63 71	64 11	
3				10				1 43				2		114 62	109 18	
1				15				1 06						80 60	62 10	
5				3				1 73						41 00	29 87	
22	3		1	68				13 09		1	7 00	12		844 45	321 10	
2				11	1	12 00		83						69 95	66 66	
1				7				70						52 47		
21	3			161			1	10 93		2	7 00	44	1	1,224 93	575 00	
6				76				3 06						292 90	146 94	
18	2			174	1	11 00		10 29		2	10 00	22		991 40	318 88	
8				27	1	12 00		3 35				1		210 44	89 13	
5	1			9				1 94						110 55	114 72	
7				10				2 86						125 55	129 55	
1				9				52						43 83	21 86	
26				150	2	22 00		14 10		2	10 00	13	2	1,164 20	602 61	
2				12				1 04				2		86 75	112 47	
9			1	30				6 78				2		300 43	352 93	2 75
4				98				7 96		1	10 00	5		827 70	532 11	
2				12				98						79 15	53 80	
6				21				2 43						98 75	28 00	
45	3			428				19 14				39	2	1,899 63	198 26 603 87	
1				1				37						19 64	7 15	
	2			5				36						41 83		
5				8				1 91		1	10 00	1		118 26	75 37	
1	1			15				1 11						52 63	29 32	
1	1			3				1 07						72 45	50 07	1 75
5	2			34	1	12 00		2 36		1	10 00			209 13	211 19	
3				12	3	35 00		2 82				5		253 40	189 90	5 50
3			1	19				2 01		2	14 00			180 15	123 60	
46	13		1	277	1	7 00		32 61	135 63	10	64 00	10		2,678 17	1,125 80	90 30
8	4			36	1	10 00		4 31		2	15 00	2		301 06	264 16	
2		6		2				1 10						45 98		
2				14				1 37						106 86	112 83	
55	1			11	2	12 00	2	1 82		1	6 00			111 63	54 06	
				1	1	12 00								7 83	13 02	
								59						9 50	8 96	
30	7		3	369				25 90	60 79	1	5 00	11	1	836 01	836 10	
294	69		5	447	4	23 00		138 93	753 30	22	113 00	155		5,766 55	4,000 14	19 28
19	2		1	19	1			6 82		2	10 00	2		291 75	187 54	
6				22				2 30				1		92 05	58 40	
12	4		4	61	1	23 00		7 10		1	2 50	8		460 20	345 18	
5	1			9				2 91						146 70	83 00	
				14												
3				4	1	12 00		1 68						75 00	54 60	
27	10			96				17 40				24		1,018 60	715 00	
4				10				1 78				2		117 70		
317	31		14	675	4	21 00		159 76	858 70	32	165 00	156		6,293 54	4,194 09	16 90
3,786	572	51	107	14,763	144	1,392 10	13	1,549 82	3,355 95	208	1,275 50	1,328	46			166 27

TABLE B.

LIST of Division Court clerks, their post office address, their county or district and number of division in which their Courts are situated, for the Province of Ontario, up to the 31st December, 1910, inclusive. (Lists corrected up to date of printing.)

County and District.	No. of Division.	Clerk.	Post office address.
Algoma	1	F. A. King	Sault Ste. Marie
	2	T. Sullivan	Bruce Mines
	3	Thos. Dodds	Thessalon
	6	W. F. Adams	Richard's Landing
	7	John Muncaster	Blind River
Brant	1	James C. Spence	Brantford
	2	Jas. Smiley	Paris
	3	S. B. Laurason	St. George
	4	W. F. Miles	Burford
	5	Walter E. Hooker	Scotland
Bruce	1	N. Crawford	Walkerton
	2	John K. McLean	Teeswater
	3	Joseph Barker	Kincardine
	4	J. C. Gibson	Paisley
	5	J. A Chapman	Port Elgin
	6	A. Nelson	Tiverton
	7	J. R. Vandusen	Tara
	8	J. H. Fielding	Wiarton
	9	Angus Martyn	Ripley
	10	Jonn Pettigrew	Lion's Head
	11	W. J. Little	Lucknow
	12	C. E. Biehn	Chesley
Carleton	1	J. R. Armstrong	Ottawa
	2	Wm. McElroy	Richmond
	3	Jas. H. Wilson, Jr.	Carp
	4	Matthew Riddell	Galetta
	5	John Kerr	North Gower
	6	W. C. Cameron	Metcalf
	7	W. A. Mason	Hintonburg
Dufferin	1	Joseph Pattulo	Orangeville
	2	D. J. Reburn	Shelburne
	3	A. Ferris	Stanton
	4	Robt. Orr	Mono Mills
	5	M. G. Varcoe	Grand Valley
Elgin	1	E. C. Monteith	Aylmer
	2	John McIntyre	St. Thomas
	3	John McIntyre	St. Thomas
	4	Samuel Maccoll	Dutton
Essex	1	C. F. Pequegnot	Sandwich
	2	G. E. Pulford	Amherstburg
	3	Geo. Pearce	Kingsville
	4	C. Bell	Oxley
	5	Geo. A. Morse	Leamington
	6	H. Taylor	Belle River
	7	Joseph D. A. Deziel	Windsor
	8	Wm. Laing	Essex
	9	A. J. Brown	Comber
	10	Jno. Watt	Scudder

List of Division Court Clerks.—Continued.

County and District.	No. of Division.	Clerk.	Post office address.
Frontenac	1	W. H. Carson	Kingston
	2	J. F. Latherland	Cataraqui
	3	J. W. Davis	Sydenham
	4	H. McMullen	Verona
	5	C. M. Van Luven	Battersea
	6	A. W. Buell	Sharbot Lake
	7	W. McGregor	Arden
Grey	1	Benjamin Allen	Owen Sound
	2	Archibald Davidson	Durham
	3	H. P. Heming	Meaford
	4	W. L. Tyson	Clarksburg
	5	W. J. Bellamy	Flesherton
	6	Wm. J. Winter	Chatsworth
	7	Duncan Campbell	Hanover
	8	Richard L. Stephen	Markdale
Haldimand	1	James McGregor	Caledonia
	2	B. Humphrey	Cayuga
	3	T. Armour	Dunnville
	4	C. E. Bourne	Jarvis
	5	Robert E. Johnson	Canboro'.
Haliburton	1	Geo. A. Rogers	Minden
	2	G. Bemister	Haliburton
	3	Stephen Kettle	Ursa
	4	Ed. B. Speers	Dorset
Halton	1	Wm. Panton	Milton
	2	A. Hillmer	Oakville
	3	C. C. Roe	Georgetown
	4	R. J. McNabb	Acton
	5	Wm. Fraser	Campbellville
	6	Ed. Donkin	Burlington
Hastings	1	F. M. Clark	Belleville
	2	W. Greer	St. Ola
	3	.....	Shannonville
	4	F. A. Bartlett	Tweed
	5	Thomas G. Clute	Stirling
	6	Dennis Gillen	Madoc
	7	Thos. Donnelly	Deseronto
	9	G. J. Chadd	Trenton
	10	J. C. Bowen	Marmora
	11	James Haryatt	Maynooth
	12	W. N. Simmons	Bancroft
Huron	1	James Yates	Goderich
	2	J. C. Greig	Seaforth
	3	H. C. Rance	Clinton
	4	John Kerney	Brussels
	5	R. N. Creech	Exeter
	6	James Whyard	Dungannon
	7	Jno. Tippett	Bayfield
	8	Alex. Ross	Wingham
	9	Thomas Brown	Wroxeter
	10	A. F. Hess	Zurich
	11	Wm. Lewis	Crediton
	12	Thos. Code	Blyth

List of Division Court Clerks.—Continued.

County and District.	No. of Division.	Clerk.	Post office address.
Kenora	1	E. Appleton	Kenora
	2	Fred Deacon	Wabigoon
Kent	1	W. B. Wells	Chatham
	2	Arthur McKinlay	Ridgetown
	3	James T. Smith	Dresden
	4	J. W. Gibson	Blenheim
	5	Charles B. Jackson	Wallaceburg
	6	Jos. Dillon	Bothwell
	7	Arthur A. Wilson	Tilbury
Lambton	1	A. F. Wade	Sarnia
	2	Wm. McLeay	Watford
	3	Jas. McIntyre	Florence
	4	Wm. W. Stover	Sombra
	5	Thomas L. Jones	Forest
	6	W. C. Tudor	Thedford
	7	John McCrea	Mooretown
	8	W. G. Fraser	Petrolea
	9	Richard Code	Alviston
Lanark	1	R. Jamieson	Perth
	2	W. A. Field	Lanark
	3	A. R. G. Peden	Carleton Place
	4	James H. Ross	Smith's Falls
	5	P. C. Dowdall	Almonte
Leeds and Grenville	1	I. J. Mansell	Brockville
	2	Jno. F. Graham	Prescott
	3	S. McCammon	Gananoque
	4	S. J. Law	Kemptville
	5	W. H. McCrea	Merrickville
	6	N. L. Phelps	Delta
	7	Cyrus A. Wood	Toledo
	8	L. S. Lewis	Newboro'
	9	E. J. Purcell	Athens
	10	C. W. McLean	Spencerville
	11	John Haley	North Augusta
	12	Charles Tennant	Mallorytown
Lennox and Addington	1	A. Knight	Napanee
	2	Fred W. Armstrong	Bath
	3	Joseph B. Allison	Adolphustown
	4	Jno. H. Patterson	Newburgh
	5	Robert Cox	Enterprise
	6	J. A. Timmerman	Odessa
	7	James Aylesworth	Tamworth
	8	J. M. Dafoe	Flinton
	9	W. J. Slater	Denbigh
Lincoln	1	Samuel Shearer	Niagara-on-the-Lake
	2	A. H. Trapnell	St. Catharines
	3	Thos. Pearson	Smithsville
	4	C. E. Riggins	Beamsville
	5	W. W. Kidd	Grimsby
Manitoulin	1	A. Hall	Gore Bay
	2	David McGilvery	Little Current
	3	F. P. Denison	Manitowaning
	4	J. J. Avis	Cockburn Island

List of Division Court Clerks.—Continued.

County or District.	No. of Division.	Clerk.	Post office address.
Middlesex	1	J. W. McIntosh	London
	2	Wm. J. McRoberts	Parkhill
	3	R. H. Collins	Lucan
	4	J. H. Matthews	Delaware
	5	G. Wilson	Glencoe
	6	John H. McIntosh	Strathroy
	7	Edward Thomas Shaw.	Dorchester Station
	8	Walter R. Westlake	Arva
	9	F. H. Whetter	London
Muskoka	1	Charles Bard	Bracebridge
	2	W. N. Moody	Gravenhurst
	3	A. R. Corbett	Huntsville
	4	Fred D. Stubbs	Port Carling
Nipissing	1	A. W. Smith	Sturgeon Falls
	2	John McMeekin	Mattawa
	3	M. W. Flannery	North Bay
	4	A. M. Daniels	Elk Lake
	5	J. A. Levesque	Bonfield
	6	Saml. Errett	Englehart
	7	Paul A. Cobbald	Haileybury
	8	S. L. Bradley	Cochrane
	9	F. L. Ferguson	Liskeard
Norfolk	1	Charles E. Freeman	Simcoe
	2	Abraham A. Tobin	Waterford
	3	Hy. McKnight	Teeterville
	4	Arthur Gerhard	Delhi
	5	M. J. McColl	Vittoria
	6	Arthur P. Barrett	Port Rowan
	7	Watson Park	Fairground
	8	W. Francis Tibbetts	Port Dover
Northumberland and Durham	1	John Moorecraft	Bowmanville
	2	L. B. Davidson	Newcastle
	3	Thos. A. Thompson	Port Hope
	4	W. S. Givens	Millbrook
	5	J. C. Rosevear	Cobourg
	6	Geo. Cuthbert.	Grafton
	7	H. S. Keyes	Colborne
	8	B. C. H. Becker	Brighton
	9	H. J. Walker	Warkworth
	10	Wm. Little	Wooler
	11	Ed. C. West	Campbellford
Ontario	1	E. L. McDonell, pro tem.	Whitby
	2	M. Gleeson	Greenwood
	3	J. W. Burnham	Port Perry
	4	R. J. Moore	Uxbridge
	5	Geo. Smith	Cannington
	6	James Gordon	Beaverton
	7	D. Leonard	Atherly
Oxford	1	V. L. Francis	Woodstock
	2	Chas. K. Curry	Drumbo
	3	A. S. Herd	Embro
	4	M. L. Bushell	Norwich
	5	Neil G. Gunn	Ingersoll
	6	John C. Ross	Tillsonburg
	7	W. S. Russell	Tavistock

List of Division Court Clerks.—Continued.

County or District.	No. of Division.	Clerk.	Post office address.
Parry Sound	1	W. J. Jones	Parry Sound
	2	John Fletcher	McKellar
	3	A. A. Young	Rosseau
	4	Walter Sharp	Burk's Falls
	5	Harry Snuggs	Magnetawan
	6	T. J. Williams	Powassan
	7	John Harper	Sundridge
Peel	1	John Clarke	Brampton
	2	H. H. Shaver	Cooksville
	3	M. C. Hillock	Caledon
	4	John McDonald	Bolton
Perth	1	D. B. Burritt	Stratford
	2	J. Dougherty	Mitchell
	3	Richard Shepherd	St, Mary's
	4	G. Brown	Shakespeare
	5	Wm. Zimmerman	Milverton
	6	Wm. Bright	Listowel
Peterborough	1	J. W. Miller	Peterborough
	2	J. L. Squires	Norwood
	3	W. Sherin	Lakefield
	4	Wm. Gallon	Apsley
	5	W. A. McMaster	Havelock
	6	J. R. McIntyre	Keene
Prescott and Russell	1	E. A. Johnson	L'Orignal
	2	P. S. Paquet	Vankleek Hill
	3	Napoleon Labrosse	St. Eugene
	4	D. Viau	Plantagenet
	5	J. S. Cameron	Cumberland
	6	A. Carson	Russell
	7	J. A. D. Landriault	Hawkesbury
	8	R. L. Downing	Routhier
	9	F. W. Langrell	Alfred
	10	Moise Rochon	Clarence Creek
	11	Peter Stewart	South Indian
Prince Edward	1	Fred Slavin	Picton
	2	J. McQuoid	Milford
	3	Charles H. Wright	Demorestville
	4	William H. C. Robin	Ameliasburg
	5	H. A. Jolley	Wellington
	6	C. H. Saylor	Bloomfield
	7	A. S. Burr	Consecon
	8	B. E. Harrison	Waupoos
Rainy River	1	W. H. Elliott	Fort Frances
	2	B. L. Phillips	Emo
	3	D. K. McGregor	Rainy River
Renfrew	1	J. H. Leach	Pembroke
	2	Hugh S. Miller	Beachburg
	3	George Eady, Jr.	Renfrew
	4	John R. Tierney	Arnprior
	5	C. Blackburn	Eganville
	6	J. R. Warren	Cobden
	7	P. J. Harrington	Killaloe Station

List of Division Court Clerks.—Continued.

County or District.	No. of Division	Clerk.	Post office address.
Simcoe	1	W. C. McLean	Barrie
	2	R. E. Stevenson	Bradford
	3	Jos. Wright	Beeton
	4	D. C. Barr	Collingwood
	5	A. Craig	Craighurst
	6	F. Webber	Orillia
	7	Angus Bell	New Lowell
	8	D. A. Lee	Alliston
	9	W. J. Martin	Penetanguishene
	10	J. R. Russell	Coldwater
Stormont, Dundas and Glengarry	1	G. H. Macgillivray	Williamstown
	2	Hugh R. Macdonald	Alexandria
	3	G. A. Milden	Cornwall
	4	Geo. Sampson	Aultsville
	5	Jas. N. Eastman	Morrisburg
	6	Jas. Collison	Iroquois
	7	M. J. Cleland	South Mountain
	8	D. G. McMillan	Finch
	9	Duncan C. McRae	Bridge End
	10	W. G. Bolster	Chesterville
	11	D. McIntosh	Strathmore
	12	John D. McIntosh	Dominionville
Sudbury	1	J. K. McLennan	Sudbury
	2	R. J. Groulx	Chelmsford
	3	J. C. McMillan	Webbwood
	4	E. A. Wright	Warren
Thunder Bay	1	R. E. Mitchell	Port Arthur
	3	G. H. Coo	Fort William
Victoria	1	Arch. Campbell	Woodville
	2	Edward D. Hand	Fenelon Falls
	3	G. W. Taylor	Bobcaygeon
	4	W. H. Kennedy	Omemee
	5	Elias Bowes	Lindsay
	6	J. F. Cunnings	Oakwood
	7	A. C. Graham	Victoria Road
Waterloo	1	Fred. Rohleder	Berlin
	2	James D. Webster	Preston
	3	Edward D. Wilkins	Galt
	4	F. H. McCallum	New Hamburg
	5	C. W. Parsill	Linwood
	6	Wm. H. Winkler	St. Jacob's
	7	A. E. Watson	Ayr
Welland	1	John M. Livingston	Welland
	2	Joseph Henderson	Marshville
	3	Jos. Clark	Ridgeway
	4	Jos. G. Cadham	Niagara Falls Sth
	5	D. J. C. Munro	Thorold
	6	Jas. E. Neff	Port Colborne

List of Division Court Clerks.—Concluded.

County or District.	No. of Division.	Clerk.	Post office address.
Wellington	1	Thos. J. Day	Guelph
	2	Wm. Nicoll	Morriston
	3	L. R. Guild	Rockwood
	4	John Brownridge	Fergus
	5	Thomas Young	Erin
	6	Henry Clark	Elora
	7	John Lunz	Drayton
	8	R. T. Smith	Arthur
	10	Richard Bride	Harriston
	11	J. C. Wilkes	Mount Forest
Wentworth	1	H. T. Bunbury	Hamilton
	2	F. D. Suter	Dundas
	3	Hugh Thompson	Waterdown
	4	H. M. McPherson	Orkney
	5	J. C. Moore	Stoney Creek
	7	G. T. Neal	Glanford
	8	Thomas Murphy	Binbrook
	9	C. H. Peebles	Hamilton
York	1	A. McL. Howard	Toronto
	2	Robert J. Corson	Markham
	3	Thos. F. McMahon	Richmond Hill
	4	K. N. Robertson	Newmarket
	5	F. G. Tremayne	Sutton West
	6	A. W. Brodie	Aurora
	7	E. W. Brown	Woodbridge
	8	John Hamshaw	Toronto Junction
	9	J. H. Richardson	West Hill
	10	E. H. Duggan	Toronto

TABLE C.

List of Division Court Bailiffs, their Post Office Address, the County or District and Number of Division in which their Courts are situated, for the Province of Ontario, up to 31st December, 1910, inclusive. (Lists corrected up to date of printing.)

County or District.	No. of Division.	Bailiff.	Post office address.
Algoma	1	T. J. Bowers	Sault Ste. Marie
	2	Chas. Hamilton	Bruce Mines.
	3	Isaac Leach	Thessalon
	6	A. Kitchen	Carterton, St. Jos. Is.
	7	Wm. G. White	Blind River
Brant	1	Jno. M. Dyckman	Brantford
	2	Horace Huston	Paris
	3	J. H. Cornell	St. George
	4	Robt. Balkwill	Burford
	5	A. M. Malcolm	S[illegible]
Bruce	1	Ezra Briggs	Walkerton
	2	John Farquharson	Teeswater
	3	George G. Collins	Kincardine
	4	Alex. Fraser	Paisley
	5	J. J. George	Port Elgin
	6	Gore Leggett	Tiverton
	7	Charles A. Richards	Tara
	8	H. G. Trout	Wiarton
	9	Geo. G. Collins	Bervie
	10	A. C. Bridge	Lion's Head
	11	R. J. Cameron	Lucknow
	12	Jno. Beatty	Chesley
Carleton	1	E. Lavoie	Ottawa
		D. Mulligan	Ottawa
		E. T. Van Nierop	Ottawa
	2	Jos. Binnington	Stapleton
	3	Wm. Falls	Carp
	4	George Owens	Antrim
	5	Wesley Hicks	Kars
	6	Ed. J. Murphy	Metcalfe
	7	A. Wilson	Hintonburg
Dufferin	1	J. Morrison	Orangeville
	2	John Reburn	Whitfield
	3	Jno. Armstrong	Earnscliffe
	4	Thos. McCandless	Mono Mills
	5	John W. Rounding	Grand Valley
Elgin	1	W. W. White	Aylmer
	2	Geo. Smiley	St. Thomas
	3	Geo. Smiley	St. Thomas
	4	A. McKellar	Dutton

List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Essex	1	Alois Master	Sandwich
	2	John Pettypiece	Amherstburg
	3	James Wigle	Kingsville
	4	Arthur T. Munger	Harrow
	5	Wm. Roach	Leamington
	6	Victor Thibert	Belle River
	7	F. St. Louis	Windsor
		Clement Reaume	Windsor
	8	James Johnston	Essex
	9	Leon Souchereau	Stoney Point
	10	J. S. Finlay	Pelee
Frontenac	1	Hiram Davis	Wolfe Island
		Chas. G. Clarke	Kingston
	2	Thos. Guess	Cataraqui
	3	S. Joyner	Sydenham
	4	E. A. Tallen	Verona
	5	E. F. Dennee	Inverary
	6	W. J. McCormic	Plevna
		W. Thomlison	Sharbot Lake
	7	John E. Hays	Arden
Grey	1	Robt. Taylor	Owen Sound
	2	Wm. Sharp	Durham
	3	E. J. McDonald	Meaford
	4	Geo. Mitchell	Clarksburg
	5	John Wright, Jr.	Flesherton
	6	James Dudgeon	Chatsworth
	7	Henry Prast	Hanover
	8	W. J. Pickell	Markdale
Haldimand	1	James Thorburn	Caledonia
	2	Robert Walker	Cayuga
	3	Wm. McIndoe	Dunnville
	4	F. Hartwell	Jarvis
	5	Harvey Ricker	Canboro
Haliburton	1	R. C. Garrett	Minden
	2		Haliburton
	3	J. M. Pickens	Ursa
	4	Angus McKay	Dorset
Halton	1	J. A. Fraser.	Milton
	2	Alex. McCleary	Oakville
	3	W. R. Brown	Georgetown
	4	John Lawson	Acton
	5	Ephraim Chapman	Campbellville
	6	Hiram Laud	Burlington
Hastings	1	Joshua Duffin	Belleville
	2	R. Casement	St. Ola
	3	W. E. Pearsall	Shannonville
	4	W. H. Davis	Tweed
	5	A. McCutcheon	Stirling
	6	C. St. Charles	Madoc
	7	A. P. Brown	Deseronto
	9	H. Mumford	Trenton
	10	O. R. Jones	Marmora
	11	P. M. Gunter	Maynooth
	12	James McCaw	Bancroft

List of Division Court Bailiffs, etc,—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Huron	1	G. C. Black	Goderich.
	2	James McNamara	Seaforth.
	3	D. Dickenson	Clinton.
	4	E. Crich	Brussels.
	5	Alex. Devitt	Exeter.
	6	James Mallough	Dungannon.
	7	Thomas W. Cameron	Bayfield.
	8	G. A. Phippen	Wingham.
	9	John Brethauer	Wroxeter.
	10	C. Eilber	Zurich.
	11	J. Beanes	Crediton.
	12	Richard Somers	Blyth.
Kenora	1	R. B. Donkin	Kenora.
	2	Thomas Hatch	Dryden.
Kent	1	Charles J. Moore	Chatham.
		A. Wells	Chatham.
	2	J. N. Wilson	Ridgetown.
	3	Alex. Cuthbert	Dresden.
	4	H. B. Marshall	Blenheim.
	5	Thos. Forham	Wallaceburg.
	6	John Eachran	Thamesville.
	7	M. Dillon	Merlin.
Lambton	1	Rich. Macdonald	Sarnia.
	2	J. F. Elliott	Watford.
	3	J. W. Bilton	Florence.
	4	N. Cornwall	Sombra.
	5	Joseph Burney	Forest.
	6	W. E. Molloy	Thedford.
	7	Ed. Harkness	Mooretown.
	8	Geo. Pearce	Petrolea.
	9	Jno. A. Cummings	Alvinston.
Lanark	1	P. J. Lee	Perth.
		Robt. Burns	Perth.
	2	Robt. White	Lanark.
	3	Max McPherson	Carleton Place.
		J. McPherson	Carleton Place.
	4	J. E. Burns	Smith's Falls.
		J. R. Polk	Smith's Falls.
	5	John Slattery	Almonte.
Leeds and Grenville	1	Ed. Young	Brockville.
		Matthew White	Brockville.
	2	Charles H. Row	Prescott.
	3	Edward M. Hiscocks	Gananoque.
	4	Michael Sweeney	Kemptville.
	5	Jno. Wilson	Merrickville.
	6	J. W. Russell	Delta.
	7	R. Richards	Frankville.
	8	H. S. Foster	Newboro.
		J. F. Whitmarsh	Westport.
	9	H. C. Phillips	Athens.
	10	Jas. P. Lawrence	Spencerville
	11	W. H. Love	North Augusta
	12	W. J. Mallory	Mallorytown.

List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Lennox and Addington	1	Z. Ham	Napanee
		Geo. Greer	Napanee
	2	.....	Bath
	3	R. H. Hawley	Dorland
	4	S. E. Sagar	Newburgh
	5	M. H. Switzer	Enterprise
	6	Geo. Watts	Odessa
	7	P. F. Carscallen	Tamworth
	8	George Sedore	Flinton
	9	Chas. P. Stein	Denbigh
Lincoln	1	Robert Chapman	Niagara-on-the-Lake
	2	Richard E. Boyle	St. Catharines
	3	A. D. Lacey	Smithville
	4	E. E. Julke	Beamsville
	5	D. E. Swayzie	Grimsby
Manitoulin	1	Thos. Griffith	Gore Bay
	2	John Ramesbottom	Little Current
	3	Robert Russell	Tehkummah.
	4	Jno. Harris	Cockburn Island
Middlesex	1	Jas. W. Hevey	London
	2	J. Hall	Parkill
	3	N. Ryan	Lucan
	4	Henry Eldidge	Delaware
	5	James Poole	Glencoe
	6	T. F. Hawkin	Strathroy
	7	W. H. Shaw	Dorchester Station
	8	Thos. A. Shoebotham	Arva
	9	C. H. James	London
Muskoka	1	R. E. Armstrong	Bracebridge
	2	Chas. Richardson	Gravenhurst
	3	H. G. Harper	Huntsville
	4	.....	Port Carling
Nipissing	1	H. Kinch	Sturgeon Falls
	2	Aime Jodouin	Mattawa
		John E. Whitten	Whitney
	3	D. McIntyre	North Bay
	4	C. M. McCarthy	Elk Lake
	5	.....	Bonfield
	6	Levi Soper	Englehart
	7	F. K. Ebbitt	Haileybury
	8	L. Boutin	Cochrane
	9	J. Latchford	Liskeard
Norfolk	1	John Allgeo	Simcoe
	2	Orlando H. Duncombe	Waterford
	3	J. H. Boyce	Windham
	4	W. Cameron	Courtland
	5	Chas. A. Dunkin	Vittoria
	6	Plewis Pierce	Port Rowan
	7	Robt. N. Smith	Fair Ground
	8	S. L. Butler	Port Dover
Northumberland and Durham	1	M. Munday	Bowmanville
	2	Jas. Coleman	Newcastle
	3	Geo. Garbutt	Port Hope
	4	Jas. Francey	Millbrook
	5	A. R. Eagleson	Coldsprings
	6	T. B. Finley	Grafton
	7	W. H. Smith	Colborne
	8	Jno. A. Marshall	Brighton
	9	William Love	Warkworth
	10	F. Ellis	Wooler
	11	M. T. Stephens	Campbellford

List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Ontario	1	B. F. Campbell	Brooklyn
	2	S. H. Stevenson	Brougham
	3	Jos. Baird	Manchester
	4	J. Steiner	Uxbridge
	5	Lachlin McBain	Cannington
	6	W. S. Glassford	Beaverton
	7	M. T. Harris	Brechin
Oxford	1	Benj. Hobson	Woodstock
	2	L. S. Kennedy	Richwood
	3	J. A. McKay	Embro
	4	Arthur Catton	Norwich
	5	Wm. Dundas	Ingersoll
	6	Thos. Fero	Tillsonburg
	7	C. Strahm	Tavistock
Parry Sound	1		Parry Sound
	2	R. S. Jackson	McKellar
	3	Wm. Atkinson	Rosseau
	4	Thos. Daniels	Burk's Falls
	5	S. Walton	Magnetawan
	6	Jno. Lang	Powassan
	7	J. P. Johnson	Sundridge
Peel	1	John W. Smith	Brampton
	2	Wm. Henry Rutledge	Cooksville
	3	D. McArthur	Caledon
	4	Thos. Barons	Bolton
Perth	1	D. W. Forbes	Stratford
	2	John Coppin	Mitchell
	3	Wm. Box	St. Mary's
	4	Jno. S. Gabel	Shakespeare
	5	F. W. Guenther	Milverton
	6	Jacob Seaburger	Listowel
eterborough	1	Thomas Laplante	Peterborough
	2	F. J. Stewart	Norwood
	3	Robt. Webster	Lakefield
	4	Robt. Webster	Lasswade
	5	A. Waller	Havelock
	6	Thos. McIntyre	Keene
Prescott and Russell	1	S. W. Wright	L'Orignal
	2	I. Labrosse	Vankleek
	3	Michael Kelly	St. Eugene
	4	John A. Peltier	Plantagenet
	5		Cumberland
	6	Thos. Yonge	Russell
	7	D. Millette	Hawkesbury.
	8	Dolphis Maranda	Fournier
	9	H. Larocque	Alfred
	10	John A. Dent	Rockland
		Moise Laviolette	Clarence Creek
	11	A. E. Hall	South Indian

List of Division Court Bailiffs, etc.—Continued.

County or District.	No. of Division.	Bailiff.	Post office address.
Prince Edward	1	S. A. Ruttan	Picton
	2	G. N. Ostrander	Milford
	3	George Farrell.	Demorestville
	4	A. Harvey	Ameliasburg
	5	F. J. Macdonald	Wellington
	6	J. W. Branscombe	Bloomfield
	7	Herman W. Weeks	Consecon
	8	E. A. Williams	Waupoos
Rainy River	1	Robt. Bolton	Fort Frances
	2	J. P. Kelly	Emo
	3	George Simpson	Rainy River
Renfrew	1	Geo. McDonald	Pembroke
		Hudson Smith	Pembroke
	2	John Beaupre	Beachburg
	3	John Devine	Renfrew
	4	John Warnock, jr.	Arnprior
	5	Wm. Luloff	Eganville
	6	Jno. Jardine.	Cobden
	7	Jno. Roche..	Killaloe Sta.
Simcoe	1	John Weymouth	Barrie
	2	W. Simpkin	Bradford
	3	M. J. Casserly	Tottenham
	4	A. W. S. Cunningham	Collingwood
	5	James Martin	Hillsdale
	6	George Reeve	Orillia
	7	Wm. Switzer	New Lowell
	8	John R. Arnold	Alliston
	9	Ed. E. J. Hewson	Penetanguishene
	10	G. A. Abbott	Coldwater
Stormont, Dundas and Glengarry	1	John Burgess	Williamstown
	2	J. J. Kennedy	Alexandria
	3	W. S. Smith	Cornwall
	4	J. P. Ferguson	Osnabruck Centre
	5	Jacob Hopper	Morrisburg
	6	G. E. Shaver,	Iroquois
	7	Andrew Redwood	South Mountain
	8		Finch
	9	K. A. McDonell	North Lancaster
	10	E. Merkley	Chesterville
	11	Chas. W. Kahala	Avonmore
	12	Donald J. Robertson	Maxville
Sudbury	1	C. Gravelle	Sudbury
	2	Elida Leblanc	Chelmsford
		W. Lyness	Chapleau
	3		Webbwood
	4	J H. Boyd	Warren
Thunder Bay	1	A. Clavet	Port Arthur
			Schreiber
	3	A. Inman	Fort William

List of Division Court Bailiffs, etc.—Concluded.

County and District.	No. of Division.	Bailiff.	Post office address.
Victoria	1	S. Dumond	Woodville
	2	E. Mark	Fenelon Falls
	3	W. Mitchell	Bobcaygeon
	4	Geo. Griffin	Omemee
	5	Peter Mitchell	Lindsay
	6	Wm. J. McCullough	Oakwood
	7		Kirkfield
Waterloo	1	Jno. Gildner	Berlin
	2	W. A. Bolduc	Preston
	3	Levi Bawtinheimer	Galt
	4	Henry Gerth	New Hamburg
	5	Benj. J. Ballard	Hawkesville
	6	Benj. J. Ballard	Hawkesville
	7	Jas. G. Watson	Ayr
Welland	1	J. C. Nixon	Welland
	2	Jno. Haymes	Marshville
	3	Jno. R. Huffman	Ridgeway
	4	Jas. Jones	Niagara Falls South
	5	R. C. Higgins	Thorold
	6	Hy. Leslie	Port Colborne
Wellington	1	Jno. Ogg	Guelph
		Wm. Young	Guelph
	2	Jno. Ogg	Guelph
	3		Rockwood
	4	Wm. M. Frank	Fergus
	5	Peter McGill	Erin
	6	J. W. Love	Elora
	7	Wm. Richards	Drayton
	8	O. D. White	Arthur
	10	Henry Torrance	Clifford
	11	Thos. Ryan	Mount Forest
Wentworth	1	John Hunt	Hamilton
	2	Alex. Misener	Dundas
	3	T. Mc. Carter	Rockwood.
	4	Alex. Misener	Troy
	5	J. F. Felker	Stoney Creek
	7	Jas. Thompson	Binbrook
	8	Jas. Thompson	Binbrook
	9	J. Greenfield	Hamilton
York	1	Chas. Synge	Toronto
	2	M. C. Selby	Locust Hill
	3	Ed. Dixon	Headford
	4	A. E. Widdifield	Newmarket
	5	Peter Grant	Sutton
	6	Ed. Kennedy	Aurora
	7	Wm. Elliston	Woodbridge
	8	A. Kaake	Weston
	9	Jos. Skelton	Scarboro
	10	Frank Woods	Toronto

TABLE D.

DIVISION COURTS, LIMITS OF THE RESPECTIVE DIVISIONS IN THE PROVINCE OF ONTARIO, AND JUDICIAL OFFICERS.

ALGOMA.

F. Stone, Judge, Sault Ste. Marie.
Edward O'Connor, J. J., Sault Ste. Marie.
M. McFadden, County Crown Attorney and Clerk P., Sault Ste. Marie.

1.—Bounded west by Thunder Bay District, 85th parallel of west longitude and east by Barr River, including all the islands in front.

2.—Bounded west by Barr River and east by the westerly boundary of the Townships of Thessalon, Kirkwood, Bridgeland, and Houghton, and by said boundary line of the last named three townships produced northerly.

3.—Bounded west by the westerly boundary of the Townships of Thessalon River, Kirkwood, Bridgeland and Houghton, and the boundary line of the last named three townships, produced northerly, and on the east by the eastern boundary of the Township of Sprague, produced northerly.

6.—Consisting of St. Joseph's Island.

7.—To comprise all that part of the District lying east of the Eastern boundary of the Third Division.

BRANT.

A. D. Hardy, Judge, Brantford.
A. J. Wilkes, C.C.A. and C.P., Brantford.

1.—The City of Brantford and that part of the Township of Brantford not included in the other divisions hereinafter described. The Townships of Onondaga and Tuscarora and that part of the Township of Brantford lying south of the main road from Branford to Hamilton and east of Fairchild's Creek.

2.—The Town of Paris and that part of South Dumfries west of the line between lots 18 and 19, and that part of the first concession of the Township of Brantford lying west of a continuation of the last-mentioned line.

3.—The remainder of the Township of South Dumfries and of the first concession of the Township of Brantford.

4.—The ten northern concessions of the Township of Burford, and all that part of the 2nd, 3rd, 4th and 5th concessions of the Township of Brantford, west of the line between lots numbers 10 and 11, and that portion of the Kerr tract west of the continuation of the last-mentioned line.

5.—The Township of Oakland, the four southern concessions of the Township of Burford and lots numbers 1 to 5, inclusive, in the ranges east and west of the Mount Pleasant Road, in the Township of Brantford, adjoining the Township of Oakland.

BRUCE.

Wm. Barrett, Judge, Walkerton.
A. B. Klien, J.J., Walkerton.
Thomas Dixon, C.C.A. and C.P., Walkerton.

1.—The Town of Walkerton and the Township of Carrick and the Township of Brant, south of the 12th concession, in the lots up to No. 26, and south of the 10th concession, in lots 26 to 34, inclusive.

2.—The Village of Teeswater, the Townships of Culross and Greenock south of the 12th concession.

3.—The Town of Kincardine, the Township of Kincardine, lying south of the 10th concession.

4.—The Village of Paisley, and that part of the Township of Brant lying north of 11th concession and west of lot 26. That part of Greenock lying north of concession 11; lots 26 to 35, inclusive, in the 8th, 9th, 10th, 11th, 12th, 13th and 14th concessions of the Township of Bruce; and Saugeen, east of a line between lots 28 and 29, and south of the proportion of the town line between Arran and Elderslie to the Saugeen River. All Elderslie lying west of the 25th side line and south of the 12th concession. And also that part lying north of concession 11 and west of lot 17.

5.—All of the Township of Amabel lying north of the 10th concession, Port Elgin and Southampton, and all Saugeen not in No. 4, Arran, west of the line between lots 10 and 11, north of Arran Lake and its outlet, and Amabel, south of concession 11, and west of concession C, and concessions 8, 9 and 10.

6.—The Village of Tiverton and all the Township of Bruce, except that part included in No. 4, and all Kincardine north of the 9th concession.

7.—Tara and all Arran, not in No. 5, and all Elderslie, not in Nos. 4 and 12, and Amabel, south of the 8th concession and east of concession lettered C.

8.—The Town of Wiarton, the Township of Albemarle and that part of Amabel not in Nos. 5 and 7.

9—The Township of Huron.

10.—The Townships of Eastnor, Lindsay, and St. Edmunds.

11.—Lucknow and the Township of Kinloss.

12.—Chesley and those parts of Brant and Elderslie not included in Nos. 1, 4 and 7.

CARLETON.

D. B. McTavish, Judge, Ottawa.

R. D. Gunn, J.J., Ottawa.

J. A. Ritchie, C.C.A. and C.P., Ottawa.

1.—Comprising all the City of Ottawa and the Township of Gloucester, to lot 15, inclusive, Rideau Front, and concessions 1 and 6, inclusive, Ottawa Front and the islands in the Ottawa River opposite thereto.

2.—The Township of Goulbourne, the 8th, 9th and 10th concessions of the Township of Marlborough, all the Township of Nepean south of the River Goodwood, and the 4th, 5th and 6th concessions thereof north of the same river to the boundary line between lots 20 and 21 in the last-mentioned concession.

3.—The Township of Huntley and the Township of March, except lots 1 to 5, inclusive, in concessions 1, 2, 3 and 4 thereof.

4.—The Townships of Fitzroy and Torbolton.

5.—The Township of North Gower, Long Island in the Rideau River, and 1st, 2nd, 3rd, 4th, 5th, 6th and 7th concessions of Marlborough.

6.—The Township of Osgoode, the 6th, 7th and 8th concessions Ottawa Front, and from lots 16 to 30, inclusive, of Rideau Front of the Township of Gloucester.

7.—The Township of Nepean, except the City of Ottawa, and part of the said Township lying south of the River Goodwood and concessions 4, 5 and 6, north of

the River Goodwood to the boundary between lots 20 and 21 in the said last-mentioned concessions, and, including also lots 1 to 5, inclusive, in concessions 1, 2, 3 and 4, in the Township of March.

DUFFERIN.

T. A. M. McCarthy, Judge, Orangeville.
W. J. L. McKay, C.C.A. and C.P., Orangeville.

1.—The Town of Orangeville, the Township of East Garafraxa and all that portion of the Township of Amaranth lying south of the southern boundary of lot No. 26, in each concession in the Township of Amaranth.

2.—The Village of Shelburne, the Township of Melancthon, and all that portion of the Township of Amaranth lying north of the southern boundary of lot number 26, in each concession of the Township of Amaranth.

3.—The Township of Mulmur.

4.—The Township of Mono.

5.—The Township of East Luther.

ELGIN.

C. W. Colter, Judge, St. Thomas.
C. O. Z. Ermatinger, J.J., St. Thomas.
A. McCrimmon, C.C.A. and C.P., St. Thomas.

1.—The Townships of Bayham, Malahide and South Dorchester.

2.—The Townships of Southwold and Yarmouth (except the City of St. Thomas).

3.—The City of St. Thomas.

4.—The Townships of Aldborough and Dunwich.

ESSEX.

M. A. McHugh, Judge, Sandwich.
G. Smith, J.J., Sandwich.
J. H. Rodd, C.C.A. and C.P., Windsor.

1.—Town of Sandwich and Township of Sandwich East.

2.—Town of Amherstburg and the Townships of Alden and Anderdon.

3.—The Village of Kingsville, and all that part of the Township of Gosfield not included in Division No. 8.

4.—The Township of Colchester South, and all Colchester North south of the 9th concession, exclusive of the said concession, and the lots on both sides of Maiden Street.

5.—Township of Mersea and Village of Leamington.

6.—The Township of Rochester, the Village of Belle River, the first concession of the Township of Maidstone, and all north of the Middle Road in the said Township of Maidstone.

7.—Town of Windsor, the Town of Walkerville, and all of Sandwich East north of the Talbot Street range.

8.—The Town of Essex, and all of the Township of Maidstone lying west of the first concession and south of the Middle Road; so much of Sandwich East as is south of Talbot Street, including the lots on both sides of said street to Nos. 306 and 307; all of Colchester north of the 9th concession, including said concession

and lots on both sides of Maiden Street, and all that part of Gosfield lying north of concession 6, and extending as far east from the limits between Gosfield and Colchester as lots No. 12, including such lot in each concession north of concession 6, inclusive.

9.—The Townships of Tilbury West and Tilbury North.

10.—The Township of Pelee.

FRONTENAC.

C. V. Price, Judge, Kingston.

J. L. Whiting, C.C.A. and C.P., Kingston.

1.—City of Kingston, Township of Garden Island, Wolfe Island, Howe Island, and part of the Township of Pittsburg.

2.—Cataraqui, the Township of Kingston and the Village of Portsmouth.

3.—Loughboro', the Townships of Loughboro' and Bedford.

4.—Verona, Townships of Portland and Hinchinbrooke.

5.—Sudbury, the Township of Storrington and part of the Township of Pittsburg.

6.—The Townships of Olden, Oso, Barrie, Clarendon, Palmerston, Miller, Canonto, and South Canonto.

7.—The Township of Kennebec.

GREY.

W. J. Hatton, Judge, Owen Sound.

C. H. Widdifield, J. J., Owen Sound.

J. Armstrong, C.C.A. and C.P., Owen Sound.

1.—The Town of Owen Sound, the Village of Brooke and the Townships of Derby, Keppel, Sarawak and Sydenham.

2.—The Town of Durham, the Township of Egremont, and those portions of the Townships of Bentinck, Normanby and Glenelg as follows:—That part of the Township of Bentinck lying east of the line between lots 30 and 31 in the 1st, 2nd and 3rd concessions south of the Durham Road, and in concessions 1, 2 and 3 north of the Durham Road, and east of the line between lots 15 and 16 in concessions 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 thereof. That part of the Township of Normanby lying east of the line between lots 20 and 21, in the 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th and 18th concessions, and all of the Township of Glenelg, excepting that portion lying east of the line between lots 10 and 11 in the 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th and 15th concessions hereof.

3.—The Town of Meaford, the Township of St. Vincent, and that part of the Township of Euphrasia, lying west of the line between the 6th and 7th concessions and north of the line between lots 15 and 16.

4.—The Township of Collingwood and the east half of the Township of Euphrasia, excepting that part thereof lying between the 4th and 5th concessions and south of the lots between 12 and 13, and east half of the Township of Osprey.

5.—The Township of Proton, the west half of the Township of Osprey, and those parts of the Township of Artemesia consisting of the ranges of lots lying parallel to the Toronto and Sydenham Road, and south of the line between lots 130 and 131, and concessions 1, 2 and 3, south of the Durham Road, and 1, 2, 3, 4, 5 and 6 north of the said Durham Road, and those portions of concessions 7,

8 and 9 lying east of the ranges of lots parallel with the Toronto and Sydenham Road, and those portions of concessions 10, 11, 12, 13 and 14 lying east of the line between lots 30 and 31.

6.—The Township of Sullivan and the Township of Holland, excepting those portions of concessions 9, 10, 11 and 12 lying south of the line between lots 15 and 16, and those portions of concessions 7 and 8 west of the ranges of lots lying parallel with the Toronto and Sydenham Road, and the ranges of lots lying parallel with the Toronto and Sydenham Road and south of the line between lots 50 and 51.

7.—All the lots from 1 to 30, inclusive, in the three concessions south and the three concessions north of the Durham Road in the said Township of Bentinck, and all the lots from 1 to 15, inclusive, in the 12th concession, from the 4th to the 15th concessions, inclusive, of the said Township of Bentinck, and all the lots from 1 to 20, inclusive, in all the concessions from 4 to 18, inclusive, in the Township of Normanby aforesaid.

8.—All the lots from 51 to 130, inclusive, in all the concessions parallel to and being northeast and southwest of the Toronto and Sydenham Road, in the Townships of Artemesia, Glenelg and Holland aforesaid; all lots to the westward of the dividing line between lots 30 and 31, in all the concessions from 10 to 14, inclusive, and all the lots from 1 to 5 in the 7th, 8th and 9th concessions, inclusive, which lie to the southwest of the third concession, southwest of the said Toronto and Sydenham Road, in the said Township of Artemesia; all the lots from 1 to 15, inclusive, in concessions 5 and 6, and all the lots from 1 to 15, inclusive, in the concessions from 7 to 12, inclusive, in the Township of Euphrasia; all lots south of the allowance for road between lots 15 and 16, in the 9th, 10th, 11th, and 12th concessions, and from lots 25 to 30, inclusive, on the 7th concession, and lots 28, 29 and 30 in the 8th concession of the said Township of Holland; and all the lots lying east of allowance for road between lots 10 and 11 in all the concessions from 7 to 15, inclusive, in the Township of Glenelg.

HALDIMAND.

G. B. Douglas, Judge, Cayuga.

J. A. Murphy, C.C.A. and C.P., Cayuga.

1.—Comprising the Township of Seneca except the first and second concessions, the Young Tract, and the property of the late Richard Martin and the late Robert Weir; all of the Township of Oneida, except the first range north of the Cayuga line, the Dennis Tract, and the lots southerly of the said tract, and the Village of Caledonia.

2.—Comprising the Township of North Cayuga, except that portion thereof lying northeast of the side line between lots 12 and 13, and 1st and 2nd concessions of the Township of Seneca, except that portion thereof lying northeast of the side line between lots 12 and 13, the Young Tract, and the lands of the late Robert Weir and Richard Martin, Esquires, in the said Township of Seneca, the first range of Oneida north of the Cayuga line, also the Dennis Tract and river lots lying south, and the Townships of Rainham and South Cayuga.

3.—Comprising the Townships of Moulton, Sherbrooke and Dunn, and the Town of Dunnville.

4.—Comprising the Township of Walpole, and the Village of Hagersville.

5.—Comprising the Township of Canboro', that portion of North Cayuga lying east of the side line between lots 12 and 13, and those parts of the 1st and 2nd concessions of the Township of Seneca lying northeast of the side line between lots 12 and 13.

COUNTY OF HALIBURTON.

(Annexed to Victoria for Judicial Purposes.)

J. E. Harding, Judge, Lindsay.
H. McMillan, J.J.
A. P. Devlin, C.P. and C.C.A., Lindsay.

1.—The Townships of Glamorgan and Snowden, except that portion of both included in the third division, and all of the Townships of Snowden, Lutterworth, Minden, Anson, Stanhope, Hindon.

2.—The Townships of Dysart, Guilford, Harburn, Dudley, Harcourt and Bruton, and that portion of Monmouth not included in the third division.

3.—All the rest of the territory comprising Township of Monmouth (except lots 1 and 19, inclusive) in 13th, 14th, 15th, 16th and 17th concessions; the south 12 concessions of the Township of Glamorgan, and from lot 21, inclusive, to the eastern boundary in the south six concessions of Snowden.

4.—The Townships of Shelbourne, McClintock, Livingstone, Lawrence, Nightingale, Havelock, Eyre and Clyde.

HALTON.

T. A. Gorham, Judge, Milton.
W. I. Dick, C.C.A. and C.P., Milton.

1.—All the territory comprised in the new survey of the Township of Trafalgar, and the first ten lots in concessions 1, 2, 3, 4, 5 and 6 in the Township of Esquesing, and the first five lots in concessions 7, 8, 9, 10 and 11 in the said township.

2.—That part of the Township of Trafalgar known as the Old Survey.

3.—All the rest of the territory comprised in concessions 8, 9, 10 and 11 in the Township of Esquesing not comprised in the first division.

4.—All the rest of the territory comprised in concessions 1, 2, 3, 4, 5 and 6, Township of Esquesing.

5.—The Township of Nassegaweya.

6.—The Township of Nelson.

HASTINGS.

G. E. Deroche, Judge, Belleville.
E. B. Fralick, J.J., Belleville.
P. J. M. Anderson, C.C.A. and C.P., Belleville.

1.—To comprise the City of Belleville and the Township of Thurlow; also all that portion of the Township of Sidney lying south of the 8th concession and east of the line between lots 18 and 19.

2.—Comprising the Townships of Wollaston, Limerick and Cashel, and the six northerly concessions of the Townships of Tudor and Grimsthorpe, and all those parts of the Township of Lake, in all the concessions thereof lying north of lots 21 in said concessions, all in the County of Hastings.

3.—The Township of Tyendinaga, except that part called Deseronto.

4.—The Township of Hungerford.

5.—All that part of the Township of Sidney which lies to the north of the 8th concession, and to the east of lot No. 6, in each concession north of the 8th concession, and all that part of the Township of Rawdon which lies to the south of the 9th concession, and that part of the Township of Huntingdon south of the 5th con-

cession; also Block A and lots 1, 2, 3, 4, 5 and 6, in the 8th and 9th concessions of the Township of Sydney heretofore forming part of the 2nd division, together with all that portion of the Township of Sidney lying north of the 7th concession, and east of the line between lots 6 and 7.

6.—The Township and Village of Madoc, all that part of the Township of Huntingdon north of the 6th concession of said township, and all of the Townships of Tudor and Grimsthorpe, except the northerly six concessions of each of the said townships.

7.—The Village of Deseronto.

9.—The Town of Trenton, and all that part of the Township of Sidney which lies to the west of lot 7 in each of the concessions of the township, including Mill Island. Also, all of said Township of Sidney lying south of the 8th concession and west of the line between 18 and 19, and east of the line between lots 6 and 7.

10.—The Township of Marmora, that part of the Township of Lake lying south of lots 22 in all the concessions thereof, and all that part of the Township of Rawdon which lies north of the 8th concession thereof.

11.—The Townships of Herschell, Monteagle, Carlow, Bangor, Wicklow and McClure.

12.—The Townships of Faraday, Dungannon and Mayo, and the Village of Bancroft.

HURON.

B. L. Boyle, Judge, Goderich.
Philip Holt, J.J., Goderich.
Chas. Seager, C.C.A. and C.P., Goderich.

1.—Comprising the Town of Goderich, that part of the Township of Goderich to the north of the Cut Line and the Huron Road until the same meets the road allowance between the 13th and 14th concessions, then back along the Huron Road to its junction with the Cut Line, then west by the road allowance between concessions 11 and 12 to the River Maitland, then along the River Maitland to Goderich, together with the Township of Colborne.

2.—Comprising the Township of McKillop, the Town of Seaforth, and all that portion of the Township of Tuckersmith not included in the third division.

3.—Comprising all that portion of the Township of Hullett south of the blind line between the 7th and 8th concessions, of the Township of Hullett, that part of the Township of Goderich not included in Nos. 1 and 7, 1st, 2nd, 3rd and 4th concessions, Township of Stanley 1st and 2nd concessions, Township of Tuckersmith, L.R.S., north of lot 15, and that portion west of side road between lots 25 and 26, H.R.S., and Town of Clinton.

4.—Comprising the Township of Grey, all of the Township of Morris east of side road between lots Nos. 10 and 11 (which is not included in No. 12), and the Village of Brussels.

5.—Comprising the Townships of Usborne and the Village of Exeter.

6.—Comprising the Townships of Ashfield and all West Wawanosh, except that portion east of Maitland River.

7.—Comprising the Township of Goderich, south of Cut Line and Huron Road until the same joins the road between the 12th and 14th concessions of the Township of Goderich; thence along the said concessions until the same joins the River Bayfield, all Stanley not included in No. 3 and the Village of Bayfield.

8.—Comprising the Village of Wingham, the Township of Turnbury, all that part of East Wawanosh not included in No. 12, and all of the Township of Morris not included in Nos. 4 and 12.

9.—Comprising the Township of Howick and the Village of Wroxeter.

10.—Comprising the Township of Hay.

11.—Comprising the Township of Stephen.

12.—Commencing at the northeast angle of the Township of Hullett, thence southerly along the easterly boundary of the said Township of Hullett to the blind line between the 7th and 8th concessions of said township, thence westerly along said line to the western boundary of the township, thence northerly along the westerly boundary of the township to the Maitland River at the southeastern corner of the Maitland Block, thence along the said river northerly till the western boundary of East Wawanosh is reached, thence northerly along said westerly boundary to the road running between the 6th and 7th concessions of said Township of East Wawanosh, thence easterly along said road to the easterly limit of said township, thence northerly along the gravel road to the road running between the 5th and 6th concessions of the Township of Morris, thence easterly along said road to the line between lots 10 and 11, thence southerly along said line between the 6th and 7th concessions, thence easterly along said line to the line between lots 15 and 19, thence southerly to the boundary line between the Townships of Morris and Hullett, thence easterly to the place of beginning, including the Village of Blyth.

DISTRICT OF KENORA.

T. W. Chapple, Judge, Kenora.

J. F. MacGillivray, C. Atty. and C.P., Kenora.

1.—To comprise all that part of the said District lying west of a line commencing at Pickerel Rapids on Cedar and Manitou Lakes, and extending northward parallel with the sixth meridian line to the northern boundary of the District.

2.—To comprise all that part of the said district lying east of the eastern boundary of the said First Division.

KENT.

Archibald Bell, Judge, Chatham.

John L. Dowling, J.J., Chatham.

H. D. Smith, C.C.A. and C.P., Chatham.

1.—The First Division to consist of the Town of Chatham and that part of the Townships of Dover East and West to the south of the 12th and 13th concession line of the Township of Dover East, and that part of the Township of Chatham south of the 12th and 13th concession line, and west of the side roads between lots 12 and 13, from the first mentioned 12th and 13th concession line to the 5th and 6th concession line, and all south of the said 5th and 6th concession line of said township; that part of the Township of Harwich north of 5th and 6th concession line, by the easterly boundary; that part of the Township of Raleigh north of the 16th concession to the west side road between lots 12 and 13 north to the 6th and 7th concession line, and all of the said township north of the said last-mentioned line, and that part of the Township of Tilbury East north of the 4th concession.

2.—The Second Division to consist of that portion of Township of Howard south of the 2nd and 3rd concession line by the eastern boundary (known as the Botany Road), and that part of the Township of Orford south of the 10th and 11th concession line of said township.

3.—The Third Division to consist of all that part of the Gore of Camden lying west of the 10th and 11th concession line, and that part of the Township of Camden

lying west of the side line between lots 6 and 1; the Village of Dresden, and that part of the Township of Chatham north of the 5th and 6th concession line and east of the side roads between lots 12 and 13.

4.—The Fourth Division to consist of that part of the Township of Harwich south of the 5th concession of the eastern boundary, and south of the 3rd concession by the western boundary, and that part of Raleigh south of the 15th concession and east of the side road between lots 12 and 13 and the road to the shore through lot 146 on the Talbot Road.

5.—The Fifth Division to consist of the Village of Wallaceburg, the Gore of Chatham and that part of the Township of Chatham northwest of the 12th and 13th concession line, and west of the said roads between lots 12 and 13, and that part of Dover East lying north of the 12th and 13th concession side road.

6.—The Sixth Division to consist of that part of the Township of Howard north of the Botany Road aforesaid, and that part of the Township of Oxford north of the 10th and 11th concession line, the Township of Rone, the Township of Bothwell, the Village of Thamesville, and that part of the Gore of Camden east of the 10th and 11th concession line, and that part of the Township of Camden east of the side line between lots 6 and 7.

7.—The Seventh Division to consist of that part of Tilbury East south of the 3rd concession, the Township of Romney, and that part of the Township of Raleigh south of the 6th and 7th concession line, and west of the side road between lots 12 and 13, in the said township, and the road through lot 147 on Talbot Road.

LAMBTON.

D. F. McWatt, Judge, Sarnia.
A. E. Taylor, J.J., Sarnia.
J. P. Bucke, C.C.A. and C.P., Sarnia.

1.—The external boundaries of the Township of Sarnia and the Town of Sarnia.

2.—The external boundaries of the Township of Warwick, including that portion of the Village of Arkona south of the township line.

3.—The external boundaries of the Townships of Euphemia and Dawn.

4.—The external boundaries of the Township of Sombra.

5.—The external boundaires of the Township of Plympton.

6.—The external boundaries of the Township of Bosanquet, including that portion of the Village of Arkona north of the township line.

7.—The external boundaries of the Township of Moore.

8.—The external boundaries of the Township of Enniskillen.

9.—The external boundaries of the Township of Brock.

LANARK.

W. S. Senkler, Judge, Perth.
E. G. Malloch, C.C.A. and C.P., Perth.

1.—The Town of Perth, and the Townships of Drummond, Bathurst, South Sherbrooke, Burgess North, and that part of the Township of Elmsley North, north of the Rideau River, within the County of Lanark, and west of lot No. 12 in each concession. The sittings of said court to be held in the Town of Perth.

2.—The Second Division to consist of the Village of Lanark, and the Townships of Lanark, Dalhousie, Darling, Lavant and North Sherbrooke. The sittings of said court to be held at the Village of Lanark.

3.—The Third Division to consist of the Town of Carleton Place and the Township of Beckwith, and the first six lots in the first seven concessions of Township of Ramsay. The sittings of said court to be held in the Town of Carleton Place.

4.—The Township of Montague, the Town of Smith's Falls, and that part of the Township of North Elmsley, from lot No. 1 to lot No. 12, in each concession, both inclusive, not within the limits of the Town of Smith's Falls. Sittings at Smith's Falls.

5.—The Township of Pakenham, the Town of Almonte, and the Township of Ramsay, with the exception of the first six lots in the first seven concessions of the said township. Sittings at Almonte.

LEEDS AND GRENVILLE.

H. S. McDonald, Judge, Brockville.
E. J. Reynolds, J.J., Brockville.
M. M. Brown, C.C.A. and C.P., Brockville.

1.—To consist of the 1st, 2nd, 3rd, 4th, 5th, 6th and 7th concessions and broken front of the Township of Elizabethtown, and the concession roads between them.

2.—To consist of the 1st, 2nd, 3rd, 4th and 5th concession, and broken front and that part of the 6th, 7th and 8th concessions from the town line of Edwardsburg to lot No. 18, inclusive, of the Township of Augusta, and the concession roads between them.

3.—To consist of the 1st, 2nd, 3rd, 4th and 5th concessions and broken front of the Townships of Leeds and Lansdowne, respectively, and the concession roads between them.

4.—To consist of the Township of South Gower, the Township of Oxford from the west side line of lots No. 11 in all the concessions of the eastern boundary of the township, and the gore of land between South Gower, Oxford and Edwardsburg.

5.—To consist of the Township of Wolford (except the 7th and 8th concessions and the allowances of roads within and between them); lots Nos. 1 to 10, inclusive, in the 2nd, 3rd, 4th, 5th, 6th, 7th and 8th concessions of the Township of Oxford, and allowances of roads within and between them.

6.—To consist of the Townships of Bastard and Burgess, and those parts of the Townships of Leeds and Lansdowne, on the north side of the rear of the 5th concession in each respectively.

7.—To consist of the Townships of Kitley and Elmsley.

8.—To consist of the Townships of North Crosby and South Crosby.

9.—To consist of that part of the Townships of Escott and Yonge, in rear of the 4th concession of Yonge, and in rear of the 6th concession of Escott; that part of the Township of Elizabethtown, in rear of the 7th concession of and west of lot No. 18 in the 8th, 9th, 10th and 11th concessions, and the allowances for roads embraced therein.

10.—To consist of the Township of Edwardsburg.

11.—To consist of that part of the Township of Augusta in rear of the 5th concession and west of lot No. 18 in the 6th, 7th and 8th concessions; the whole of the 9th and 10th concessions of the Township of Augusta; the Gore between the Townships of Oxford, Wolford and Augusta; that part of the Township of Elizabethtown in rear of the 7th concession, and east of the commons, between lots No. 18 and 19 in the 8th, 9th and 10th concession; the 7th and 8th concessions of the

Township of Wolford; lots No. 1 to 10, inclusive, in the 9th and 10th concessions of the Township of Oxford; and the allowance for roads embraced therein.

12.—To consist of the 1st, 2nd, 3rd and 4th concessions and broken front of the Township of Yonge; the 1st, 2nd, 3rd, 4th, 5th and 6th concessions and broken front of the Township of Escott, and the allowances for roads embraced therein.

The said 1st, 2nd and 12th divisions shall respectively embrace and comprehend within their lines those portions of the River St. Lawrence and islands therein, within the exterior lines of which such portions of said river and islands would lie and be, if such exterior side lines were produced and extended in that direction to the utmost limits of the Province.

LENNOX AND ADDINGTON.

Jas. H. Madden, Judge, Napanee.

H. M. Deroche, C.C.A. and C.P., Napanee.

1.—The Town of Napanee, Township of Richmond, all that part of North Fredericksburg and Adolphustown lying north of Hay Bay, and all that part of North Fredericksburg lying north of Big Creek.

2.—Comprises 1st concession of Ernestown, the Village of Bath, the Township of Amherst Island, and the 2nd, 3rd and 4th concessions of the said Township of Ernestown, from the west limits thereof to the west limit of lot No. 21 in each concession.

3.—Township of South Fredericksburg and all that part of North Fredericksburg and Adolphustown not included in Division No. 1.

4.—1st, 2nd and 3rd concessions of the Township of Camden and the Village of Newburg.

5.—All that part of the Township of Camden not included in Division No. 4.

6.—All that portion of the Township of Ernestown not included in the limits of Division No. 2.

7.—Township of Sheffield.

8.—Townships of Kaladar, Anglesea and Effingham.

9.—Townships of Abinger, Ashby and Denbigh.

LINCOLN.

R. B. Carman, Judge, St. Catharines.

M. Brennan, C.C.A. and C.P., St. Catharines.

1.—The Town and Township of Niagara.

2.—The Township of Grantham (including the City of St. Catharines), the Villages of Merritton and Port Dalhousie and the Township of Louth.

3.—The Townships of Caistor and Gainsborough and the 9th concession of the Township of Grimsby, including the 1st and 2nd ranges as part of the said concession.

4.—The Village of Beamsville and the Township of Clinton.

5.—The Village of Grimsby, the Township of North Grimsby, and the Township of South Grimsby, except that portion included in the Third Division.

DISTRICT OF MANITOULIN.

C. E. Hewson, Judge, Gore Bay.

A. G. Murray, C.A., and C.P., Gore Bay.

1.—The Town of Gore Bay, the Townships of Gordon, Allan, Campbell, Mills, Burpee, Robinson, Dawson, The Islands, Barrie, Clapperton and the Duck Islands,

and that part of the Township of Billings lying west of the road allowance between lots 15 and 16 in the several concessions thereof, and so much of the Township of Carnarvon as lies west of Lake Mindemoya and north of the line between the 6th and 7th concessions thereof.

2.—The Town of Little Current, the Township of Howland and those parts of the Townships of Sheguindah and Bidwell lying north of the line between the 6th and 7th concessions of Sheguindah and the 4th and 7th concessions of the Township of Bidwell, and the 6th and 7th concessions of the line between lots 17 and 18 in the Township of Billings, and the adjacent islands lying north and east of the said Townships, except the Clapperton Island.

3.—Manitowaning, the Townships of Assiginack, Tehkummah and Sandfield, and those parts of the Township of Sheguindah lying south of the line between the 4th and 5th concessions of the Township of Bidwell and the 6th and 7th concessions of the Township of Billings to the line between lots 17 and 18 of said township, and the Township of Carnarvon, except so much of the same as lies west of Mindemoya Lake, and all the part of Manitoulin lying east of the Township of Assiginack, Manitowaning and South Bays and the islands adjacent thereto.

4.—Cockburn Island.

MIDDLESEX.

Talbot Macbeth, Judge, London.

Edward Elliott, J.J., London.

J. B. McKillop, C.C.A., and C.P., London.

1.—That part of the City of London lying to the west of Maitland street with that portion of the Township of London lying south of the line between the 4th and 5th concessions and west of the said street, produced northerly on a line in the same direction to the line between the said 4th and 5th concessions, and with that portion of the Township of Westminster lying west of the main road leading south from Clark's Bridge, across the Thames, south to the line between the 1st and 2nd concessions, and westerly to the line between lots 42 and 43, and extending northerly to the River Thames, and also including the Village of London West.

2.—The Villages of Parkhill and Ailsa Craig, the Townships of East Williams and West Williams, and that portion of the Township of Lobo lying north of the line between the 11th and 12th concessions, and east of the lines between lots Nos 12 and 13.

3.—The Townships of McGillivray and Biddulph and the Village of Lucan.

4.—The Township of Delaware, with that portion of the Township of Westminster west of the line between lots 30 and 31 in the 2nd concession, then southerly on the line between lots 20 and 21 to the southerly limit of the township, including all west of said line, and also including all that portion of the front of said Township of Westminster lying west of the line between lots Nos. 42 and 43, not included in the first division, with that portion of the Township of Caradoc lying south of the line between the 5th and 6th concessions to the River Thames, and with that portion of the Township of Lobo lying south of the line between the 6th and 7th concessions, to the River Thames.

5.—The Township of Ekfrid and Mosa, including the Villages of Wardsville, Newbury and Glencoe.

6.—Townships of Adelaide and Metcalfe, the Town of Strathroy, with that portion of the Township of Caradoc lying north of the line between the 3rd and 4th concessions, with that portion of the Township of Lobo which lies north of the 6th concession and west of the line between lots 12 and 13 of the said township.

7.—The Township of North Dorchester, north and south of the River Thames, that portion of the Township of West Nissouri which lies south of the line between lots 14 and 15, and with that portion of the Township of Westminster lying south of the line between the 1st and 2nd concessions and east of the line between lots 30 and 31 in the 2nd concession and thence east of the line between lots 20 and 21, continued south to the southerly limit of the said Township of Westminster.

8.—All that portion of the Township of London which lies north of the line between the 4th and 5th concessions, that portion of the Township of Lobo which lies north of the line between the 6th and 7th concessions, and east of the line between lots 12 and 13 to the line between the 11th and 12th concessions and with all that portion of the Township of West Nissouri which lies north of the line between lots 14 and 15.

9.—All that part of the City of London lying east of Maitland Street; that part of the Township of London, lying north of the line between the 4th and 5th concessions and east to the said street, produced northerly or in a line in the same direction to the line between the said 4th and 5th concessions and that part of the Township of Westminster lying north of the line between the 1st and 2nd concessions, and east of the main road leading south from Clarke's Bridge across the Thames.

DISTRICT OF MUSKOKA.

W. C. Mahaffy, Judge, Bracebridge.

Thomas Johnson, C.A., and C.P., Bracebridge.

1.—The Village of Bracebridge and the Townships of Macaulay, McLean, Ridout, Monck and Caldwell, concessions 1, 2, 3, 4, 5, 6, 7, 8 and 9 in the Townships of Stephenson, Brunel, and Franklin, and that part of the Township of Watt situated east of lot 21, in the several concessions thereof; and concessions 7, 8, 9, 10, 11, 12 and 13 in the Townships of Muskoka and Draper.

2.—The Village of Gravenhurst, the Townships of Morrison, Ryde and Oakley, and concessions 1, 2, 3, 4, 5 and 6 of the Townships of Muskoka and Draper.

3.—The Village of Huntsville, the Townships of Stisted, Chaffey and Sinclair, and concessions 10, 11, 12, 13 and 14 in the Townships of Stephenson, Brunel and Franklin.

4.—The Township of Wood, Medora and that part of the Township of Watt situated on the west of lot 11 in the several concessions thereof.

DISTRICT OF NIPISSING.

Jos. A. Valin, Judge, North Bay.

H. D. Leask, J.J., North Bay.

A. G. Browning, C.A., and C.P., North Bay.

1.—To be composed of the Townships of Springer, Field, Badgerow, Caldwell, and all that part of the District of Nipissing which is situated west of the line between the Indian Reserve and the Township of Widdifield, produced south to the boundary of the said District, and north to the north-east boundary of the Township of Gooderham, and south of the said line marking the northern boundary of the said Township of Gooderham and its production to the North-western boundary of the Township of Pardo.

Sittings of the Court, Sturgeon Falls.

2.—To be composed of the Townships of Mattawan, Olrig, Calvin, Papineau, Lauder, Pentland, Boyd, Osler, McLaughlin, Canisby, Sabine, Lyell, Airy, Murchi-

son, and Robinson, and all that part of the District of Nipissing situated east of the line between the Townships of Bonfield and Calvin, produced south to the provisional County of Haliburton and east of the line between the Townships of Phelps and Olrig, produced north to the Ottawa River.

Sittings of the Court, Mattawa.

3.—To be composed of the Townships of Widdifield, Merrick, Mulock, Phelps, Ferris, Chisholm, Ballantyne, Wilkes, Biggar, Paxton, Butt, Devine, Hunter, McCraney, Finlayson, Peck, and all that part of the District of Nipissing situated west of the line between the Townships of Phelps and Olrig, produced north to the Ottawa River, thence along the Ottawa River to the north-east angle of the Township of Wyse, thence along the line marking the northern boundary of the said Township of Wyse, produced westerly to the eastern boundary of the First Division, thence south along the eastern boundary of the First Division to the southern boundary of the District.

Sittings of the Court, North Bay.

4.—To be composed of so much of the District as lies south of the southern boundary of the Townships of Langmuir, Blackstock, and Timmins, produced easterly to a point which shall meet the line between the Townships of Eby and Otto, produced northerly and west of the line between the Townships of Eby and Otto, produced north to a point where the line of production of the south boundary of the Townships of Langmuir, Blackstock and Timmins, and produced southerly to the northern boundary of the Township of Hobbs.

Sittings of the Court, Elk Lake City.

5.—To be composed of the Townships of Bonfield and Boulter.

Sittings of the Court, Town of Bonfield.

6.—To be composed of that part of the District that lies north of the northern boundary of the Townships of Cane, Henwood, Kerns, Harley, and Casey, and east of the boundary line between the Townships of Tudhope and Bryce, produced northerly to the production easterly of the southerly boundary of the Township of Timmins.

Sittings of Court, Englehart.

7.—To be composed of that portion of the District lying south of the northerly boundary of the Townships of Klock, Barr, Firstbrook, and Bucke, and east of the line between the Townships of Van Nostrand and Klock, produced southerly to the northern boundary of the Township of Hobbs.

Sittings of the Court, Haileybury and Cobalt, alternately.

8.—To be composed of that portion of the District lying north of the southerly boundary of the Townships of Langmuir, Blackstock, and Timmins and produced easterly to the eastern boundary of the District.

Sittings of the Court, Cochrane.

9.—To be composed of the Townships of Cane, Henwood, Kerns, Harley, Casey, Auld, Lundy, Hudson, Dymond, Harris and the Town of New Liskeard.

Sittings of the Court, New Liskeard.

NORFOLK.

James Robb, Judge, Simcoe.

T. R. Slaght, C.C.A. and C.P., Simcoe.

1.—The Town of Simcoe, the Gore of the Township of Woodhouse and all that part of said Township lying west of the side line between lots 5 and 6, together with that part of the 4th, 5th and 6th concessions lying west of the said line between lots 12 and 13.

2.—The Township of Townsend and the Village of Waterford.
3.—The Township of Windham.
4.—The Township of Middleton and the Village of Delhi.
5.—The Township of Charlotteville.
6.—The Townships of North Walsingham, South Walsingham and the Village of Port Rowan.
7.—The Township of Houghton.
8.—The Village of Port Dover, and that part of the Township of Woodhouse not included in Division 1, viz.: all that part of the 1st, 2nd and 3rd concession lying east of the side line between lots 5 and 6, and that part of the 4th, 5th and 6th concessions lying east of the said line, between lots 12 and 13 in said township.

NORTHUMBERLAND AND DURHAM.

T. M. Benson, Judge, Cobourg.
G. M. Roger, J.J., Cobourg.
W. F. Kerr, C.C.A. and C.P., Cobourg.
1.—Townships of Cartwright and Darlington and the Town of Bowmanville.
2.—Township of Clarke and Village of Newcastle.
3.—Township of Hope and Town of Port Hope.
4.—Townships of Cavan, Manvers, South Monaghan and Village of Millbrook.
5.—Township of Hamilton and Town of Cobourg.
6.—Townships of Haldimand and Alnwick.
7.—Township of Cramahe and Village of Colborne.
8.—Township of Brighton and Village of Brighton.
9.—Township of Percy and Village of Hastings.
10.—Township of Murray.
11.—Township of Seymour and Village of Campbellford.

ONTARIO.

N. McCrimmon, Judge, Whitby.
D. J. McIntyre, J.J., Whitby.
J. E. Farewell, C.C.A. and C.P., Whitby.
1.—Including the Townships of Whitby and East Whitby and the Towns of Whitby and Oshawa.
2.—The Township of Pickering.
3.—The Townships of Reach and Scugog and the Village of Port Perry.
4.—The Townships of Uxbridge and Scott and the Town of Uxbridge.
5.—The Township of Brock and the Village of Cannington.
6.—The Township of Thorah and all that part of the Township of Mara lying south of the line between the 4th and 5th concessions.
7.—All that part of the Township of Mara lying north of the line between the 4th and 5th concessions thereof, and the Township of Rama.

OXFORD.

Alex. Finkle, Judge, Woodstock.
F. R. Ball, C.P., Woodstock.
R. N. Ball, C.C.A., Woodstock.
1.—Comprising the City of Woodstock, the Township of East Oxford, and that part of the Township of East Zorra, lying south of the line between lots number

twenty-five and twenty-six of the Township of Blandford, and that part of the Township of North Oxford lying east and north of the road between lots 16 and 17 to the boundary of the Township line between North and West Oxford, and that part of the Township of West Oxford lying east of the road between lots 6 and 7 to the boundary of the Township of East Oxford, and that part of the Township of Blandford lying south of the 10th concession.

2.—Comprises the Township of Blenheim.

3.—Comprises the Township of East Nissouri and West Zorra and the Village of Embro.

4.—Comprises the Townships of North Norwich and South Norwich and the Village of Norwich.

5.—Comprises the Town of Ingersoll and that part of the Township of North Oxford lying west and south of the road between lots No. 16 and 17 of the Township of West Oxford, and that part of the Township of West Oxford lying south of the road between lots 6 and 7 to the line between West Oxford and East Oxford, and those portions of the Township of Dereham being part of the 1st concession of the said Township of Dereham, west of the Middle Town Line.

6.—Comprises the Town of Tillsonburg and that part of the Township of Dereham not included in the Fifth Division.

7.—Comprising the Village of Tavistock and that part of the Township of East Zorra, north of the road between lots 25 and 26, and that part of the Township of Blandford lying north of the 10th concession of the said township.

DISTRICT OF PARRY SOUND.

P. McCurry, Judge, Parry Sound.

W. L. Haight, C.A. and C.P., Parry Sound.

1.—The Town of Parry Sound and the Townships of Foley, McDougall, Cowper and Carling, and all that portion of the district lying to the west of the east boundary of Carling, produced to the French River.

2.—The Townships of McKellar, Ferguson, Hagerman, Croft, and all that portion of the district lying between the east boundary of Ferrie and the west boundary of Ferguson, produced to the French River.

3.—The Townships of Humphrey, Christie, Monteith and Conger.

4.—Townships of McMurrich, Perry, Armour, Proudfoot and Bethune.

5.—Townships of Spence, Chapman, Ryerson and Lount.

6.—That territory bounded on the west by the western boundaries of the Townships of Pringle and Patterson, and the western boundary of the Township of Patterson, produced to the French River and Lake Nipissing; on the east by the boundary of the District of Parry Sound, and on the south by the southern boundaries of the Townships of Himsworth, Gurd and Pringle.

7.—The Townships of Machar, Laurier, Strong and Joly.

PEEL.

D. McGibbon, Judge, Brampton.

W. H. McFadden, C.C.A., and C.P., Brampton.

1.—Township of Brampton, Township of Chinguacousy and northern division of the Township of Toronto Gore.

2.—Village of Streetsville, Township of Toronto and southern division of the Township of Toronto Gore.

3.—Township of Caledon.

4.—Village of Bolton, Township of Albion.

PERTH.

J. A. Barron, Judge, Stratford.

G. G. McPherson, C.C.A., and C.P., Stratford.

1.—To consist of all that part of the Township of North Easthope west of the line between lots 25 and 26, and south of the road between the 8th and 9th concessions, and all that part of the Township of South Easthope west of the side line between lots 25 and 26; all that part of the Townships of Downie and Gore north and east of the concession line between the 10th and 11th concessions and the Oxford Road; and all the Township of Ellice from the 1st to 13th concession, inclusive.

2.—To consist of all that part of the Township of Fullarton not included in Division No. 3, and the Townships of Hibbert and Logan.

3.—To consist of that portion of the Township of Downie west of the Oxford Road, and south of the concession line between the 10th and 11th concessions; the Township of Blanshard; all that part of the Township of Fullarton comprising the 13th and 14th concessions, and south of a road leading from Mitchell Road, between lots 24 and 25, east of lot 3 in the 10th concession; thence east along the line between the 10th and 11th concessions to the town line.

4.—To consist of that part of the Township of North Easthope east of the line between lots 25 and 26, and the north of the 8th concession, inclusive, with the 9th and 10th concessions; all that part of the Township of South Easthope not included in Division 1.

5.—To consist of the Township of Mornington, and all that part of the Township of Elma from lots 13 to 72, both numbers inclusive, of the 1st concession, and from lots 27 to 16, both numbers inclusive, in and from the 2nd to the 18th concession, both concessions inclusive, of the said Township of Elma; and concessions 14, 15 and 16 of the Township of Ellice; and concessions 11, 12, 13 and 14 of the Township of North Easthope.

6.—To consist of the Township of Wallace and all that part of the Township of Elma from the 1st concession to the 18th concession, both concessions inclusive, and comprising lots Nos. 1 to 52, both inclusive, of the 1st concession, and lots Nos. 1 to 26 inclusive from the 2nd to the 18th concession, both concessions inclusive.

PETERBOROUGH.

E. C. Huycke, Judge, Peterborough.

R. E. Wood, C.C.A., and C.P., Peterborough.

1.—Shall comprise the City of Peterborough, the Townships of North Monaghan and Ennismore, all the Township of Smith lying south of the 7th concession, all that part of the Township of Otonabee lying west of the 8th concession and north of lots Nos. 21 and all that part of the Township of Douro lying south of lots numbered 11.

Court to be held at the Court House in the City of Peterborough.

2.—Shall comprise the Village of Norwood, the Township of Asphodel, and all that part of the Township of Dummer lying east of the 5th concession and that part of the said Township of Dummer lying west of the 6th concession and south of lots numbered 11. Court to be held in the Town Hall in the Village of Norwood.

3.—Shall comprise that part of the Township of Smith lying north of the 6th concession, all that part of the Township of Douro lying north of lots num-

bered 10, that part of the Township of Dummer lying west of the 6th concession and north of lots numbered 10, the Township of Galway, the Township of Harvey and the Village of Lakefield. Court to be held in the Town Hall in the Village of Lakefield.

4.—Shall comprise the Townships of Anstruther, Burleigh, Cavendish and Chandos. Court to be held in the Town Hall at Apsley.

5.—Shall comprise the Townships of Belmont and Methuen and the Village of Havelock. Court to be held in the Town Hall in the Village of Havelock.

6.—Shall comprise the Township of Otonabee, except that part thereof lying west of the 8th concession and north of lots numbered 21. Court to be held in the Town Hall, at Keene, in said township.

PRESCOTT AND RUSSELL.

A. Constantineau, Judge, L'Orignal.

A. Johnston, J.J., L'Orignal.

J. Maxwell, C.C.A., and C.P., L'Orignal.

1.—Comprises the whole of the Township of Longeuil, the municipality of the Village of L'Orignal, and the 1st concession of the Township of Caledonia.

2.—Comprising all that part of the Township of West Hawkesbury, extending from front of 3rd concession to the rear of the said township.

3.—Comprises the whole of the Township of East Hawkesbury.

4.—Comprising the Township of North Plantagenet, and that part of the Township of South Plantagenet lying north of the Nation River.

5.—Comprising the whole of the Township of Cumberland.

6.—Comprising the whole of the Township of Russell.

7.—Comprising the two front concessions of the Township of West Hawkesbury, and the Municipality of Hawkesbury Village, within the same.

8.—Comprising the Township of Caledonia (excepting the 1st concession of the said township), and also that portion of the Township of South Plantagenet lying south and east of the Nation River.

9.—Comprising the whole of the Township of Alfred.

10.—Comprising the whole of the Township of Clarence.

11.—Comprising the whole of the Township of Cambridge.

PRINCE EDWARD.

D. Morrison, Judge, Picton.

Jas. R. Brown, C.C.A., and C.P., Picton.

1.—The Town of Picton, the 2nd and 3rd concessions of "Military Tract" from the west line of No. 13 eastward; Gore "G"; 1st and 2nd concessions north of the Carrying Place, 1st concession southeast of the Carrying Place, and 2nd concession north of Black River, including Gores "K" and "L" and McCan Gores, all in the Township of Hallowell; Block "I" in the concession north and east of East Lake, and Gore "B" in the Township of Athol, and 1st and 2nd concessions south of the Bay of Quinte, and Gore "A" in the Township of North Marysburg, and 1st concession southwest of Green Point to the end of Carman's Point in Sophiasburg.

2.—The Township of South Marysburg, and the Southern part of Athol, commencing at the outlet of East Lake, thence down to the head of the Lake, thence down to the base line between the 1st concession south and the 1st concession north of East Lake, till it strikes the township line of Hallowell, thence down said township line till it strikes South Marysburg.

3.—The Township of Sophiasburg, together with Big Island, excepting the 1st concession southwest of Green Point to the end of Carman's Point.

4.—All that part of the Township of Ameliasburg lying east of the line between lots 86 and 87, in the 1st, 2nd, 3rd and 4th concessions of said township, including Huff's Island.

5.—That part of the Township of Hillier not included in the 7th division, also the first and 2nd concessions north of West Lake, and west of lot No. 7 in the said concession, and that part of Irwin Gore lying north and west of lot No. 7 in the 2nd concession and the west part of the 2nd concession produced west of lot No. 74 in that concession in the Township of Hallowell.

6.—Block (IV.) four, concession south side of West Lake, 1st concession "Military Tract," 2nd and 3rd concessions of said tract west of Lots No. 13, in those concessions, Gore "E," 1st and 2nd concessions north of West Lake, and east of lot No. 6 in those concessions; the Gerrow Gore and that part of Irwin Gore not included in Division No. 8, and all that part of the 2nd concession produced east of lot No. 75 in the Township of Hallowell.

7.—All that part of the Township of Ameliasburg lying west of the line between lots No. 86 and 87, in the 1st, 2nd, 3rd and 4th concessions of said township; all that part of the 4th and 5th concessions of the Township of Hillier west of the line between lots 86 and 87 and the 3rd concession west of the line between lots No. 22 and 23, with that part of the 2nd concession lying North of Pleasant Bay in the said Township of Hillier.

8.—All the point lying east of the west line of Marshland's Gore, the concession lying North of Smith's Bay and Waupoos Island in the Township of North Marysburg.

DISTRICT OF RAINY RIVER.

R. Fitch, Judge, Fort Frances.

A. D. George, C.A., and C.P., Fort Frances.

1.—To comprise all that part of the said District lying east of the east boundaries of the Townships of Aylesworth, Lash, Carpenter, Kingsford and Fleming, and east of the east boundary of the said Township of Fleming produced north to the north boundary of the said District, to be styled "The First Division Court in the District of Rainy River."

2.—To comprise all that part of the said District lying west of Division No. 1 and east of the east boundaries of the Townships of Morley, Morley Additional, Pattullo, Sifton and Dewart, and east of a line drawn north astronomically from the northeast angle of the said Township of Dewart to the north boundary of the said District, to be styled "The Second Division Court in the District of Rainy River."

3.—To comprise all that part of the said District lying west of Division No. 2, to be styled "The Third Division Court in the District of Rainy River."

RENFREW.

D. J. Donahue, Judge, Pembroke.

J. R. Metcalf, C.C.A., and C.P., Pembroke.

1.—Comprising the Town of Pembroke, the Townships of Pembroke, Stafford, Alice, Petawawa, Buchan, Rolph, Wylie, McKay, Fraser, Herd, Clara and Maria, and all that part of the Township of Wilberforce from the 18th to the 25th con-

cessions, both inclusive, and also those parts of the 14th, 15th, 16th and 17th concessions of the same Township of Wilberforce lying north of Snake River and east of Lake Dore.

2.—Comprising all that part of the Township of Westmeath lying east and north of the Muskrat Lake and River, and all those parts of the Township of Ross, from the 5th to the 9th concessions, both inclusive, east of Muskrat Lake, and from the 7th to the 13th (of the other) concessions, both inclusive, of the said Township of Ross.

3.—Comprising the Town of Renfrew and the Townships of Horton, Admaston, Bagot, Blythfield, Brougham and Matawachan, in the said County of Renfrew.

4.—Comprising the Village of Arnprior and the Township of McNab.

5.—Comprising the Townships of Grattan, Sebastopol, South Algoma, North Algoma, and all that part of the Township of Wilberforce, from the 1st to the 17th concessions, both inclusive, excepting those parts of the 14th, 15th, 16th and 17th concessions of said Township of Wilberforce lying north of Snake River and east of Lake Dore.

6.—Comprising the Township of Bromley, and all that part of the Township of Westmeath west of Muskrat Lake, and all those parts of the Township of Ross, from the 1st to the 14th concessions, both inclusive, of the said Township of Ross.

7.—Comprising the Townships of Brudenell, Radcliffe, Raglan, Lynedoch, Griffith, Hagarty, Sherwood, Jones, Richards and Burns.

SIMCOE.

J. A. Ardagh, Judge, Barrie.

E. A. Wismer, J.J., Barrie.

J. R. Cotter, C.C.A., and C.P., Barrie.

1.—Comprising the Town of Barrie, the Township of Vespra, except that portion lying west of the Nottawasaga River, and excepting also lots Nos. 38, 39 and 40, in the 1st and 2nd concessions, and lots Nos. 1, 2 and 3 in the 3rd, 4th, 5th, 6th and 7th concessions respectively. That portion of the Township of Oro lying south of lots Nos. 21 in the 1st and 2nd concessions (including the ranges), and south of lots Nos. 13 in the 3rd, 4th, 5th, 6th, 7th and 8th concessions respectively; that portion of the Township of Innisfil lying east of lots Nos. 5 in the 6th, 7th and 8th concessions, and that portion lying north of the 8th concession; that portion of the Township of Essa lying north of lots Nos. 19 in the 7th, 8th, 9th, 10th and 11th concessions.

2.—The Village of Bradford, the Township of West Gwillimbury, excepting thereout lots Nos. 1, 2, 3, 4 and 5 in the 14th and 15th concessions; the Township of Innisfil, excepting that portion lying north of the 5th concession, and excepting also lots Nos. 1, 2, 3, 4, and 5 in the 1st, 2nd, 3rd, 4th and 5th concessions thereof.

3.—The Township of Tecumseh, excepting concessions 12, 13, 14 and 15; the Township of Adjala, excepting that portion lying north of lot No. 25 in the 8th concession thereof.

4.—The Town of Collingwood, the Village of Stayner, that portion of the Township of Nottawasaga lying north of lot No. 18 in the 12th concession thereof; that portion of the Township of Sunnidale lying north of the 8th concession; that portion of the Township of Floss lying west of the Nottawasaga River; the islands in Lake Huron contiguous to the Township of Nottawasaga.

5.—The Township of Floss, except that portion lying west of the Nottawasaga River; the Township of Medonte, except that portion lying east of the 10th concession and north of lots Nos. 10 in the 9th and 10th concessions respectively; that

portion of the Township of Oro lying north of the southern boundaries of lots Nos. 21 in the 1st and 2nd concessions, and north of the southern boundaries of lots Nos. 13 in the 3rd, 4th, 5th, 6th, 7th and 8th concessions respectively; lots 38, 39 and 40 in the 1st and 3rd concessions, and lots Nos. 1, 2 and 3 in the 3rd, 4th, 5th, 6th and 7th concessions of the Township of Vespra.

6.—The Town of Orillia, the Township of Orillia, southern division, the Township of Orillia, northern division, except that portion lying north of lots Nos. 15 in the first seven concessions thereof; that portion of the Township of Oro lying east of the 8th concession; that portion of the Township of Medonte, being composed of lots Nos. 1 to 6 (both inclusive) in the 11th, 12th, 13th, and 14th concessions; the islands in Lake Simcoe contiguous to the townships and portions of townships above described lying wholly or for the most part opposite thereto.

7.—The Township of Nottawasaga, except that portion lying north of lot No. 18 in the 12th concession thereof; the Township of Sunnidale, except that portion lying north of the 8th concession; that portion of the Township of Vespra lying west of the Nottawasaga River; that portion of the Township of Essa lying north of lots 19 in the 1st, 2nd, 3rd, 4th, 5th and 6th concessions; that portion of the Township of Tossorontio lying north of lots Nos. 20 in each of the seven concessions thereof.

8.—The Township of Essa, except that portion lying north of lots Nos. 19 in each of the eleven concessions thereof; the Township of Tossorontio, except that portion lying north of lots No. 20 in each of the seven concessions thereof; that portion of the ownship of Innisfil, being composed of lots Nos. 1, 2, 3, 4 and 5 in the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th concessions; the 12th, 13th, 14th and 15th concessions of the Township of Tecumseh; lots Nos. 1, 2, 3, 4 and 5 in the 14th and 15th concessions of the Township of West Gwillimbury; that portion of the Township of Adjala lying north of lots Nos. 25 in the eight concessions thereof.

9.—The Town of Penetanguishene and the Village of Midland, the Township of Tiny; that portion of the Township of Tay lying west of the 8th concession; the islands in Lake Huron contiguous to the Township of Tiny, and to that part of the Township of Tay, forming part of the 9th division, and lying wholly and for the most part opposite thereto.

10.—The Township of Matchedash, that portion of the Township of Orillia, northern division, lying north of lots Nos. 15, in the first seven concessions thereof; that portion of the Township of Medonte lying north of lots Nos. 6, in the 11th, 12th, 13th and 14th concessions, and that portion lying north of lots Nos. 10, in the 9th and 10th concessions thereof; the Township of Tay, except that portion lying west of the 8th concession; the island in Lake Huron, contiguous to that portion of the Township of Tay, forming part of the 10th division, and lying wholly or for the most part opposite thereto.

NOTE.—Each of the said several divisions shall include all allowances for roads embraced within its external limits, and shall also extend to the centre of every allowance for road lying external and adjacent to every such division, excepting always where any such last-mentioned allowance is hereinbefore declared to belong to or form part of any particular division.

STORMONT, DUNDAS AND GLENGARRY.

J. R. O'Reilly, Judge, Cornwall.
J. W. Liddell, J.J., Cornwall.
Jas. Dingwall, C.C.A., and C.P. Cornwall.

1.—Township of Charlottenburg, in the County of Glengarry.

2.—Township of Lochiel, in the County of Glengarry.
3.—Township of Cornwall, in the County of Stormont.
4.—Township of Osnabruck, in the County of Stormont.
5.—Township of Williamsburg, in the County of Dundas.
6.—Township of Matilda, in the County of Dundas.
7.—Township of Mountain, in the County of Dundas.
8.—Township of Finch, in the County of Stormont.
9.—Township of Lancaster, in the County of Glengarry.
10.—Township of Winchester, in the County of Dundas.
11.—Township of Roxborough, in the County of Stormont.
12.—Township of Kenyon, in the County of Glengarry.

SUDBURY.

J. J. Kehoe, Judge, Sudbury.
J. H. Clary, C.A., and C.P., Sudbury

First Division Court.—That part of the District of Sudbury as follows: Commencing at the southwest angle of the township No. 82; thence on a line produced north to the northwest angle of the Township of Fairbank; thence east to the southeast angle of the Township of Rayside; thence north to the northwest angle of the Township of Creelman; thence east to the northeast angle of the same township; thence south to the southeast angle of the township, thence east to the line between the Township of Aylmer and Mackelcan, thence south on that line to the southern boundary.

Second Division Court.—So much of the district as lies north of a line produced westerly from the southeast angle of the Township of Rayside to the west boundary of the said district.

Third Division Court.—So much of the District as lies West of a line produced north from the southwest angle of the Township Number 82, to the northwest Angle of the Township of Fairbank, thence West to the boundary of the said District.

Fourth Division Court.—So much of the district as lies east of the line between the Townships of Aylmer and Mackelcan produced to the southern boundary of the said district.

THUNDER BAY DISTRICT.

H. H. O'Leary, Judge Port Arthur.
Jno. McKay, J.J.
W. F. Langworthy, C.A., and C.P., Port Arthur.

1.—All that part of the district lying west of the meridian of 87 degrees of west longitude, to the meridian of the most easterly part of Hunter's Island, excepting therefrom the Municipality of Neebing.

3.—Comprising the Municipality of Neebing.

VICTORIA.

J. E. Harding, Judge, Lindsay.
H. McMillan, J.J., Lindsay.
A. P. Devlin, C.C.A., and C.P., Lindsay.

1.—The first consists of the following townships and parts of townships, viz.: Of the 15th concession of the Township of Mariposa, and the Township of Eldon, except the ranges north and south of the Portage Road.

2.—All the Township of Fenelon, except that portion lying east of the Scugog River, and south of Sturgeon Lake, and the Township of Somerville.

3.—The Township of Verulam.

4.—The Township of Emily.

5.—The Town of Lindsay, Township of Ops, and that portion of the Township of Fenelon, lying east of the Scugog River, and south of Sturgeon Lake.

6.—The Township of Mariposa, except the 15th concession.

7.—The Townships of Carden and Dalton, Laxton, Digby and Longford, and the Township of Bexley, and that portion of the Township of Eldon north of Portage Road, and the range south of Portage Road.

WATERLOO.

D. Chisholm, Judge, Berlin.

W. H. Bowlby, C.C.A., and C.P., Berlin

1—All that portion of the Township of Waterloo lying north of Blockline on the west side of the Grand River and that part of the upper block of said township lying north of said township lying on the east side of the Grand River, north of lots Nos. 115, 109, 104, 86 and 95, to the Guelph Township line, including the Towns of Berlin and Waterloo.

2.—All that part of the Township of Waterloo lying south of the Blockline on the west side of the Grand River, and that part lying on the east side of the Grand River, south of the northern boundary of lots Nos. 115, 109, 104, 85 and 95, to the Guelph Township line, including the Villages of Preston and Hespeler.

3.—All that portion of the Township of North Dumfries lying east of lot No. 19 in the 7th concession, and running a course with the eastern boundary of the said lot in a northerly direction up to the 12th concession; thence along the eastern boundary of lot No. 23, in the said 12th concession, to the township line, including the Town of Galt.

4.—The Township of Wilmot, including the Village of New Hamburg.

5.—The Township of Wellesley.

6.—The Township of Woolwich.

7.—All that part of the Township of North Dumfries lying west of the eastern boundary of said lot No. 19, in the 7th concession; thence along the eastern limits of the said lot No. 19, the same course thereof, in a northerly direction to the 15th concession; thence along the westerly limit of lot No. 23, in the said 12th concession to the township line, including the Village of Ayr.

WELLAND.

George W. Wells, Judge, Welland.

T. D. Cowper, C.C.A., and C. P., Welland.

1.—The Township of Crowland; that part of the Township of Thorold lying south of the lines between lots 178 and 195, running through to Pelham; that part of Pelham lying south of the 4th concession, and that part of Humberstone lying north of the concession line, between the 4th and 5th concessions, being the whole of the 15th concession and the Town of Welland.

2.—The Township of Wainfleet.

3.—The Township of Bertie, and those parts of the Township of Humberstone not included in Nos. 1 and 6, and the Village of Fort Erie.

4.—The Township of Willoughby, the Village of Chippawa, and that part of the Township of Stamford south of the line between lots 136 and 137; easterly from the westerly limit of the township to the southeast angle of lot No. 133; thence north on the line between lots Nos. 132 and 133, to the northern boundary of the township, including the towns of Clifton and Navy Island.

5.—Those parts of the Township of Stamford, Thorold and Pelham not included in any other division, and the Town of Thorold.

6.—All the Township of Humberstone lying south of the 5th concession, and west of the side lines between lots Nos. 9 and 10, in the several other concessions thereof, and the Village of Port Colborne.

WELLINGTON.

A. C. Chadwick, Judge, Guelph.
Joseph Jamieson, J.J., Guelph.
H. W. Peterson, C.C.A., and C.P., Guelph.

1.—The Town and Township of Guelph.

2.—The Township of Puslinch.

3.—The Township of Eramosa.

4.—The Township of Nichol, excepting the 11th and 12th concessions; the Municipality of Fergus; the first eight concessions of the Township of Garafraxa; and lots 1 to 18, both inclusive, in concessions A and B of the Township of Peel, lots 13, 14, 15, 16, 17 and 18, in concessions 18 and 19, and lots 19, 20 and 21 in the 17th concession of the Township of Peel.

5.—The Township of Erin.

6.—The Township of Pilkington, and the 11th and 12th concessions of the Township of Nichol; the Municipality of the Village of Elora, and lots Nos. 19 and upwards belonging to the 9th, 10th, 11th, 12th, 13th, 14th, 15th and 16th concessions of Peel.

7.—Concessions 1 to 16, inclusive, of the Township of Marybroo', and concessions 1 to 16, inclusive, of the Township of Peel, except lots 19, 20, 21, 22 and 23 of those concessions in that township.

8.—That part of the Township of Arthur south and southeast of lot 15, on the west side of the Owen Sound Road, in the Township of Arthur; that part of the Township of Luther from 1 to 16, both inclusive; and lots 1 to 12, both inclusive, of the 17th and 18th concessions of the Township of Peel; lots 5 to 11, both inclusive, of the 19th concession of said Township of Peel; and lots 19 to 23, both inclusive, of concessions A and B of said Township of Peel.

9.—The territory formerly comprised in this division is now in the County of Dufferin.

10.—The Township of Minto.

11.—The Town of Mount Forest, and that part of the Township of Arthur north of lot 16, west of the Owen Sound Road; lot 17, on the Owen Sound Road, and lot 13, east of the Owen Sound Road.

WENTWORTH.

C. G. Snider, Judge, Hamilton.
J. F. Monck, J.J., Hamilton.
S. F. Washington, C.C.A., and C.P., Hamilton.

1.—All that part of the Township of Barton lying east of the lines between lots 14 and 15, and all that part of Hamilton City east of Hughson street.

2.—The whole of the Township of Flamboro' West, the Town of Dundas, and the east half of the Township of Ancaster.

3.—The whole of the Township of Flamboro' East.

4.—The whole of the Township of Beverly and the west half of the Township of Ancaster.

5.—The whole of the Township of Saltfleet.

7.—The whole of the Township of Glanford.

8.—The whole of the Township of Binbrook.

9.—All that part of the Township of Barton lying west of the lines between lots 14 and 15, and part of Hamilton City west of Hughson street.

YORK.

John Winchester, Judge, Toronto.
Edward Morgan, J.J., Toronto.
F. M. Morson, J.J., Toronto.
H. L. Drayton, C.C.A., Toronto.
H. E. Irwin, C.P., Toronto.
Toronto City.—Crown Attorney, J. W. Seymour Corley.

1.—The City of Toronto east of Yonge street, at date 14th September, 1875 (*i.e.*, Bloor, Sherbourne and Howard streets on the north, the Don on the east, down to Queen street, and south of Queen street as far as Lee avenue).

2.—Concessions 5 to 11, inclusive, of the Township of Markham, and concessions 5 to 10, inclusive, of the Township of Whitchurch, from 1 to 10, inclusive, together with the Villages of Markham and Stouffville.

3.—Concessions 1 to 4, inclusive, of the Township of Markham, and concessions 1 to 4, inclusive, of the Township of Whitchurch, from lots 1 to 10, inclusive, and concessions 1 to 3, inclusive, of the Township of Vaughan.

4.—The Township of Whitchurch, from the line between lots 10 and 11 northward; and the Township of East Gwillimbury.

5.—The Townships of Georgina and North Gwillimbury.

6.—The Townships of King and the incorporated Village of Aurora.

7.—Concessions 4 to 11, inclusive, of the Township of Vaughan.

8.—All that portion of the Township of York lying west of Yonge street, and the Township of Etobicoke.

9.—Township of Scarboro' and all that portion of the Township of York which lies east of Yonge street and the Village of Leslieville.

10.—The City of Toronto, west of Yonge street, at date of 10th September, 1875 (*i.e.*, Bloor street on the north and Dufferin street on the west).

DIVISION COURT TARIFF.

Fees to be received by the several Clerks and Bailiffs of Division Courts from and after 1st of September, 1910.

Form I.

Clerk's Fees.

1. Receiving claim, numbering and entering in procedure book $0 15
   (This item to apply to entering in the procedure book a transcript of judgment from another Court, but not an entry made for the issue of a judgment summons.)

2. Issuing summons, with necessary notices and warnings thereon, or judgment summons (as provided in forms) in all
   Where claim exceeds $10 and does not exceed $20 ..... $0 40
   Where claim exceeds $20 and does not exceed $60 50
   Where claim exceeds $60 and does not exceed $100 60
   Where claim exceeds $100 ..... 1 00
   (N.B.—In replevin and interpleader suits the value of goods to regulate the fee.)
3. Copy of summons, including all notices and warnings thereon 25
4. Copy of claim (including particulars), when not furnished by plaintiff 25
5. Copy of set-off or counterclaim (including particulars), when not furnished by defendant 25
   (Note.—In either of the last two preceding items the fee may be taxed against the party ordered to pay costs.)
6. Receiving and entering bailiff's return to any summons, writ or warrant issued under the seal of the Court (except summons to witness and return to summons or paper from another division) 15
7. Taking confession of judgment 10
   (This does not include affidavit and oath, chargeable under item 8.)
8. Every necessary affidavit if actually prepared by the Clerk, and administering oath to the deponent 25
9. Furnishing duly certified copies of the summons and notices and papers with all proceedings, for purposes of appeal (under section 127), as required by either party, per folio of 100 words 05
10. Certificate therewith 25
11. Certifying under seal of the Court and delivering to a judgment creditor a memorandum of the amount of judgment and costs against a judgment debtor, under The Creditor's Relief Act, or for any other purpose 25
12. Copies of papers, for which no fee is otherwise provided, necessarily required for service or transmission to the Judge, each 10
    If exceeding two folios, per folio 05
13. Every notice of defence or admission entered, or other notice required to be given by the Clerk to any party to a cause or proceeding, including mailing, but not postages 15
14. Entering final judgment by Clerk, on special summons, where claim not disputed 50
15. Entering every judgment rendered at the hearing, or final order made by the Judge 50
    (Note.—This fee does not apply to any proceeding on judgment summons.)
    (This one fee of 50 cents will include the service of recording at the trial and afterwards entering in the procedure book the judgment, decree and order in its entirety, rendered or made at the trial. If a garnishee proceeding before a judgment, the fee of 50 cents will be allowed for the judgment in respect to the primary debtor, and a like fee of 50 cents for the adjudication, whenever made, in respect to the garnishee.)
16. Subpœna to witness 25
    (The subpœna may include any number of names therein, and only one original subpœna shall be taxed, unless the Judge otherwise orders.)
17. For every copy of subpœna required for service 05

18. Summons for jury (including copy for each juryman), when required by parties 1 25
19. Calling and returning jury ordered by the Judge 25
20. Every order of reference, or order for adjournment, made at hearing, and every order requiring the signature of the Judge, and entering the same, including final order of judgment debtor's examination.. 25
(Any warning necessary with order, *e.g.*, the warning in Form 73, forms part of the order.)
21. Transcript of judgment to another Division Court 25
22. (Abolished—Transcript to County Court.)
23. Every writ of execution, warrant or attachment or warrant of commitment and delivering same to bailiff 50
24. Renewal of every writ of execution, when ordered by the judgment creditor, or of warrant of commitment, when ordered by the Judge.. 15
25. Every bond, when necessary, and prepared by the clerk (including affidavits of justification and of execution) 1 00
26. For necessary entries in the debt attachment book, in each case (in all) 20
27. Transmitting transcript of judgment; or transmitting papers for service to another division; or to the Judge, on application to him, including necessary entries and mailing, but not including postage.... 25
28. Receiving papers from another division for service, entering the same, handing to the bailiff, receiving and entering his return and transmitting the same (if return made promptly, not otherwise)..... 30
29. Search by person not party to the suit or proceeding, to be paid by the applicant 10
Search by party to the suit or proceeding, where the suit or proceeding is over one year old 10
(No fee is chargeable for search to a party to the suit or proceeding, if the same is not over one year old.)
30. Taxing costs, in defended suits, after judgment pronounced..... 25
31. Making out statement of costs in detail (including bailiff's fees) at the request of any party, or for the purpose of settlement, or upon entering judgment by default 10
(Neither item 30 nor 31 applies to statement of costs endorsed on summons or copy to be served.)
32. Taxing bailiff's costs, under section 188 of the Division Courts Act (R.S.O.), 1897 25
33. Copying and transmitting to municipal clerk, Judge's decision to appeal 50

2.—BAILIFF'S FEES.

1. Service of summons issued under the seal of the Court, or Judge's summons or order on each person, except summons to witness and summons to juryman:—
Where claim exceeds $10 and does not exceed $20 ..... $0 30
Where claim exceeds $20 and does not exceed $60 40
Where claim exceeds $60 and does not exceed $100 50
Where claim exceeds $100 75
(In interpleader suits the value of the goods to regulate the fee.)

2. For every return as to service under item 1; attending at the clerk's office and making the necessary affidavit (as provided by Rule 183) 15

3. Service of summons on witness or juryman, or service of notice 15

4. Taking confession of judgment and attending to prove 10

5. For calling parties and their witnesses at the sitting of the court, in every defended case, and at the hearing of every judgment summons 15

6. Enforcing every writ of execution or summons of replevin, or warrant of attachment or warrant against the body, each:
   Where claim does not exceed $20 50
   Where claim exceeds $20 and does not exceed $60 75
   Where claim exceeds $60 ..... 1 00
   (Where goods replevied, the value of the goods to regulate the amount of the fee. This fee does not include service of summons in replevin on defendant.)
   Fees under Creditor's Relief Act (see section 7 of 52 Vict., cap. 12; and section 25 of R.S.O., cap. 65) shall be taxed according to the tariff.

7. Every mile necessarily travelled to serve summons, or process, or other necessary papers, or in going to replevy goods, or to seize on attachment, or in going to seize on a writ of execution, where money, paid on demand, or made on execution, or case settled after seizure 12

8. Mileage going to arrest under warrant, when arrest made, per mile 12

9. Mileage carrying delinquent to prison, including all expenses and assistance, per mile 20

10. Every schedule of property seized, attached, or replevied, including affidavit of appraisal, when necessary:
    Exceeding $10 and not exceeding $20 30
    Exceeding $20 and not exceeding $60 50
    Exceeding $60 75

11. Every bond, when necessary, when prepared by the bailiff, including affidavit of justification and execution 50

12. Every notice of sale, not exceeding three, under execution, or under attachment, each 15

13. Reasonable allowances and disbursements, necessarily incurred in the care and removal of property:

    (*a*) If a bailiff removes property seized, he is entitled to the necessary disbursements, in addition to the fees for seizure and mileage.

    (*b*) If he takes a bond, then to 50 cents, instead of disbursements for removal of property.

    (*c*) If assistance is necessary in the seizure, or securing, or retaining of property, the bailiff is entitled to the disbursements for such assistance.

    (*d*) All charges for disbursements are to be submitted to the clerk for taxation, subject to appeal to the Judge.

    (*e*) The baliff must in all cases endorse a memorandum of all his charges on the back of the execution, or state them on a separate slip of paper, so that the clerk may conveniently tax the bailiff's charges for fees and disbursements.

(*f*) The Clerk is in all cases to sign the memorandum of his taxation and preserve it among the papers in the cause, together with the execution, for future reference, and thereby enable the clerk to certify the bailiff's returns properly.

14. If execution or process in attachment in the nature of execution be satisfied in whole or in part, after seizure and before sale, whether by action of the parties or otherwise, the bailiff shall be entitled to charge and receive 3 per cent. on the amount directed to be levied; or on the amount of the value of the property seized, whichever shall be the lesser amount.

15. Poundage on executions, and on attachments in the nature of executions, 5 per cent., exclusive of mileage for going to seize and sell, upon the amount realized from property necessarily sold.

3.—FEES TO WITNESSES AND APPRAISERS.

Allowances to Witnesses.

Attendance, per diem, to witnesses within three miles of the place where the Court is held, if within the county	$0 75
And if without the county	1 00
Attendance, if witness resides over three miles from the place of sittings and within the county, per diem	1 00
Attendance, if witness resides without the county and more than three miles from the place of sittings, per diem	1 25
Barristers and solicitors, physicians and surgeons, engineers and veterinary surgeons, other than parties to the cause, when called upon to give evidence of any professional service rendered by them, or to give professional opinions, per diem	4 00

(Note.—Disbursements to surveyors, architects and professional witnesses, such as are entitled t ospecific fees, by statute, are to be taxed, as authorized by such statute.

If witnesses attend in one case only, they will be entitled to the full allowance.

If they attend in more than one case, they will be entitled to a proportional part in each cause only.)

The travelling expenses of witnesses, over three miles, shall be allowed according to the sums reasonably and actually paid, but in no case shall exceed 20 cents per mile, one way.

FEES OF APPRAISERS.

Fees to Appraisers of Goods, etc., Seized under Warrant of Attachment.

To each appraiser, $1.00 per day, during the time actually employed in appraising goods—to be paid in the first instance by plaintiff and allowed as costs in the cause.

FEES IN SUITS NOT EXCEEDING $10.

(Section 48 D.C. Act.)

Clerk.

For all services, from entering action, or suing out a judgment or interpleader summons, up to and including the entering of final judgment, or final order on any such judgment or interpleader summons, in case the action proceeds to judgment or final order $1 25

In case the action does not proceed to judgment or final order, the fees heretofore, or that may hereafter be payable, but not exceeding in the whole the sum.

For issuing writ of execution, warrant of attachment, or warrant for arrest of delinquent and entering the return thereto 50

Bailiff.

For all services rendered in serving summons and making return, and any other service that may be necessary before the judgment is entered by the clerk or pronounced by the Judge, mileage excepted 50

For enforcing execution, schedule of property seized, or attached bond, where necessary, and all other necessary acts done by him, after seizure, mileage excepted, if money made or case settled, after levy.... 1 00

(Necessary disbursements incurred in the care and removal of property shall be allowed to be first taxed by the clerk, subject to the approval of the Judge.)

REPORT

OF THE

Inspector of Legal Offices

ONTARIO

1910

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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To His Honour JOHN MORISON GIBSON, K.C., LL.D., etc., etc.,
Lieutenant-Governor of the Province of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned begs respectfully to present to Your Honour the twenty-eighth annual report of the Inspector of Legal Offices for the year ending 31st day of December, 1910.

J. J. FOY,
Attorney-General.

TORONTO, March 8th, 1911.

REPORT

OF THE

Inspector of Legal Offices, 1910

To His Honour JOHN MORISON GIBSON, K.C., LL.D.,
Lieutenant-Governor of Ontario, etc., etc.

Sir,—I have the honour to present the twenty-eighth annual Report of the Inspector of Legal Offices upon the affairs of the Judicial Offices of the Province for the year ending the 31st December, 1910.

A list of the officers appointed during the year, with a reference to the issue of the Ontario Gazette in which each appointment was published, will be found in appendix "L" to this Report.

SHERIFFS.

Remarks in former reports as to the inadequacy of the Sheriffs' incomes still hold good. There are 47 Sheriffs in the Province. Of these, ten, whose incomes were less than $1,200.00, are entitled to receive from the Province, payments under the Statute 9 Edward VII, chapter 6, section 39. The incomes of two, who are paid in part by salary, were also each under $1,200.00, but they are not entitled to payments under the Statute. Of the rest, twelve had incomes less than $1,500.00, fifteen less than $2,000.00, three less than $3,000.00, while the incomes of the remaining five were over $3,000.00.

The Returns for 1910 of twenty-four sheriffs shew a decrease in income, as compared with their incomes for the previous year, as follows: five shew a decrease of from $1.00 to $50.00, two of from $50.00 to $100.00, seven of from $100.00 to $150.00, one of from $150.00 to $200.00, two of from $200.00 to $300.00, three of from $300.00 to $400.00, three of from $400.00 to $450.00. In one office the decrease was $598.95.

In twenty-one offices there was an increase as follows:—Two shew increases of from $1.00 to $50.00, two of from $50.00 to $100.00, five of from $100.00 to $150.00, two of from $150.00 to $250.00, one of from $250.00 to $300.00, three of from $300.00 to $400.00, one of from $400.00 to $500.00, two of from $500.00 to $600.00, two of from $600.00 to $650.00, while in one office the increase is $1,660.28.

As stated in former Reports, where fines or the proceeds of estreated recognizances are received by a sheriff without his having to make a levy for same, he may retain only two per cent. of the sum received. Some sheriffs have to be reminded of this repeatedly.

A want of care in making entries in their books was noticeable. References were not made in the Process or Execution books to the page of the Fee Book where the fees received in respect of Process or Writs of execution are entered. In one office I found fees and office disbursements omitted from this book. In two the moneys received on writs of execution were not entered in the Fi. Fa. (or Suitors') cash book.

The amounts received quarterly by the Sheriffs for their accounts against the Province and County should be shown in the Fee Book. These accounts are audited each quarter by Boards of Audit appointed by the various County Councils, and are afterwards further revised by an officer of the Province.

The Statute 9 Edward VII, chapter 48, section 6, renders obsolete the printed notice in the books in use by the Sheriffs under the Creditors' Relief Act. Sheriffs must therefore substitute the entry given as Form 1, of the Schedule to this Statute, which is as follows:—

"I have on this day in my hands for distribution under the Creditors' Relief Act among the creditors of . . . , the sum of $ . . . and the distribution will be made among the creditors of the said . . . . entitled to share therein, at the expiration of one month from this day.

"Dated . . . . . 19 . . .

"SHERIFF."

At the request of the Judges of the High Court I have, by circular letter, dated February 15th, 1911, requested the Sheriffs, at least three days before the commencement of every sitting of the High Court in their respective Counties, to send to the Justice who is to take the sitting, addressed to him at Osgoode Hall, Toronto, a list of the prisoners in gaol, with their ages, the reasons for their commitment to gaol, and if sentenced the reason of their detention in the gaol.

LOCAL MASTERS.

Law stamps amounting to $63.10 were missing from the papers in the offices of the Local Masters. In one the Master's book was in arrears.

On the whole, however, the duties of these officers were well performed.

In appendix "B" is set out in tabulated form the statistical returns of the Local Masters for the year 1910.

LOCAL REGISTRARS, DEPUTY REGISTRARS, DEPUTY CLERKS OF THE CROWN, COUNTY AND DISTRICT COURT CLERKS.

Law stamps were missing as follows:—from suit papers $91.90, for the Shorthand Reporters' Fund, $14.00, and in respect of searches made for the Mercantile Agencies $11.00. I also found $2.30 in Law Stamps unnecessarily affixed to papers.

Jury Fees amounting to $322.50 had not been paid over to County Treasurers. They should be paid over at the close of every High Court or County Court Sitting, and the Treasurer's receipt taken therefor. In the Provisional Judicial Districts the Jury Fees are payable to the Hon. the Provincial Treasurer.

In one office moneys paid into and out of Court had not been recorded in the book required by Con. Rules 1221 to 1223; and in one instance the moneys paid in were deposited by the officer to his private account. The rules require that they be deposited to the credit of the particular cause or matter in respect of which they are paid in.

Entries were not always made in the Order books of those orders which are not required by the rules to be entered in full. The style of cause with a brief note of the purport of such orders must be entered.—H. & L. Rule 636 and notes.

In some cases the Index to the Process or Procedure books had not been written up, and in one office entries were made in the Procedure book though no proceedings had been taken other than the issue of the writ of summons. Only where an additional step has been taken in the action, such as appearance entered, order for substitutional service or Lis Pendens, judgment signed on default of appearance, or the like, should the action be transferred to the Procedure Book.

Some failed to insert in their Chattel Mortgage books, or to properly indorse upon the discharged Mortgage or last renewal thereof, the Certificate required by section 29 of the Bills of Sale and Chattel Mortgage Act, 10 Edward VII, chapter 65. The officer's name and not his initials, must be signed to such Certificate. The necessity for this certificate renders it imperative on the officer, before fyling a discharge of Chattel Mortgage, to see that the document tendered for registration is in fact a discharge of the Mortgage which it purports to discharge.

The circular letter referred to at page 6 of my report for 1909 has not in all cases been complied with. Officers are expected to forward to the Justice who is to take the sitting of the High Court the list in said circular referred to. Rules 555 and 556 must be strictly complied with; a list of the exhibits should accompany the papers forwarded to Toronto. Owing to their disregard of these matters I have been obliged to address to all Local Registrars, Deputy Registrars and Deputy Clerks of the Crown another Circular letter.

Appendix "C" is a return of the business of the High Court of Justice in the offices of the Local Registrars, Deputy Registrars, and Deputy Clerks of the Crown, while Appendix "D" is a return of the business done in the offices of the Clerks of the County and District Courts for the year 1910.

Surrogate Court Registrars.

In nine offices law stamps were missing from the Surrogate Papers. The amount due the Province as represented by these stamps was $462.84. I also found uncancelled stamps amounting to $20.30 affixed to the papers.

Notwithstanding instructions contained in my last annual report as to the papers to be fyled on applications for Probate, Administration, etc., I found the following important papers missing; the Inventories, the affidavit of value and relationship and the affidavit of plight.

An additional fee of $1.00 for the Judge on every grant of Probate or Administration has been provided by Schedule B to the Statute 10 Edward VII., chapter 31. This fee, however, must not be collected on Estates coming within section 73, sub-section 1, of the Surrogate Courts Act, 10 Edward VII., chapter 31, nor in Guardianship matters. This dollar must be halved, like other fees, on estates coming within section 73, sub-section 4 of the Act.

The fees allowed by a former Inspector for the affidavits and fylings required by the Succession Duties Act must not be collected in estates coming within section 73, sub-section 1, of the Surrogate Courts Act; the only sums allowed in addition to the $2.00 provided by sub-section 2, are the amounts expended for postage, and the 30 cents authorized by 1 Edward VII., chapter 12, section 8, sub-section (d), in law stamps for the Surrogate Clerk.

Registrars must be careful to see that the Letters Probate, Administration and Guardianship conform in all respects with the forms required by the Surrogate Rules. On perusing these documents as copied in the Registers I found whole lines omitted, words transposed, and the like.

When accounts are to be passed before the Surrogate Judge, the petition, Judge's appointment, and the accounts properly verified by affidavit, must be fyled with the Surrogate Registrar as soon as the appointment is given.

Appendix "E" gives in tabulated form the business of the Registrars for the year 1910.

County and District Crown Attorneys and Clerks of the Peace.

In three offices the Returns of Convictions made to these officers by Justices of the Peace were not all entered. Crown Attorneys should see that all Justices shew the disposition made by them of the fines, and that fines payable to the Province are remitted. A perusal of these returns, and of the returns made by Police Magistrates, often shew that fines for cases coming within Dominion or Provincial Statutes are paid the Municipalities instead of the Province.

A copy of the Jurors Book was not always fyled with the Local Registrar and in a few cases this book did not conform strictly with the forms given in the Statute.

I found Sessions books, County Judges' Criminal Court dockets, and other books not fully entered to date.

General Remarks.

New rules numbered 1304 to 1307 inclusive having been issued, I have supplied the officers with printed copies.

Many Police Magistrates cause much inconvenience by reason of their delay in forwarding to this office the quarterly returns of their Convictions. In some cases fines imposed by them for assault, theft, gambling, etc., which by the Statutes are payable to the Province, have been paid to the Municipalities.

The Statute 10 Edward VII., chapter 5, materially reduced the percentages payable on income.

The sums paid under this Statute for 1910 amounted to $7,956.30, as follows:

Local Registrars and Deputy Clerks of the Crown.....	$6,175 16
Crown Attorneys and Clerks of the Peace.....	1,781 14

Appendix "F" is a statement of the fees and emoluments of the several officers for the year 1910, and of the sources from which they derive their incomes.

In Appendix "G" is set out the more important business of the High Court of Justice at Toronto during 1910, compiled from statements received from the officers in Osgoode Hall.

Appendix "H" shows the number of actions tried or otherwise disposed of by the Justices of the High Court and of the Court of Appeal and the dispositions thereof during the year 1910.

Appendix "I" is a statement of the business transacted in the office of the Surrogate Clerk at Osgoode Hall, for the year 1910.

Appendix "J" shows the Criminal business of the High Court of Justice at its sittings throughout the Province during the year, while Appendix "K" gives in tabulated form the business of the Courts of General Sessions of the Peace and of the District and County Court Judge's Criminal Courts of the Province for the same period.

I have the honour to be,

Sir,

Your obedient Servant,

JAS. W. MALLON,

Inspector.

OSGOODE HALL, March 1st, 1911.

APPENDIX A.—Containing in tabulated form Statistics as returned

Counties or Districts.	Number of writs of summons received for service		Number of subpœnas received for service in—				Number of orders for arrest.		Number of other process.		Total process received.	
			Criminal Cases.		Civil Cases.							
	H.C.	C.C.	H.C.	C.C.	H.C.	C.C.	H.C.	C.C.	H.C.	C.C.	H.C.	C.C.
Algoma	7	13	2	27	2	1	.....	1	3	11	14	53
Brant	15	39	4	108	3	.....	1	.....	.....	.....	23	147
Bruce	8	19	3	5	1	.....	.....	.....	4	4	16	28
Carleton	88	137	6	7	16	6	.....	1	22	9	132	160
Dufferin	3	6	2	3	.....	.....	.....	.....	1	1	6	10
Elgin	12	24	.....	8	3	.....	1	.....	12	9	28	41
Essex	15	19	3	22	16	.....	1	.....	10	2	45	43
Frontenac	12	24	1	10	2	4	.....	.....	.....	.....	15	38
Grey	11	14	1	15	1	.....	.....	.....	2	1	15	30
Haldimand	14	20	.....	60	24	.....	.....	.....	38	80	76	160
Halton	7	15	4	7	.....	2	.....	.....	6	3	17	27
Hastings	24	27	9	39	1	2	.....	.....	5	10	39	78
Huron	22	17	.....	16	2	.....	.....	.....	6	1	30	34
Kenora	7	17	1	4	3	2	.....	.....	12	9	23	32
Kent	22	27	2	20	7	.....	.....	.....	2	2	33	49
Lambton	13	7	3	12	.....	.....	.....	.....	5	.....	21	19
Lanark	13	23	3	7	.....	.....	.....	.....	7	3	23	33
Leeds and Grenville	7	18	3	35	2	.....	.....	2	6	3	18	58
Lennox and Addington	5	3	2	1	1	.....	.....	1	1	1	9	6
Lincoln	14	12	3	19	2	.....	.....	.....	6	1	25	32
Manitoulin	1	6	.....	.....	1	.....	.....	.....	1	1	3	7
Middlesex	22	43	2	37	13	5	.....	.....	13	3	50	88
Muskoka	3	14	55	62	.....	.....	.....	.....	.....	.....	58	76
Nipissing	12	26	20	17	.....	.....	1	1	.....	.....	33	44
Norfolk	9	6	.....	6	2	1	.....	.....	.....	.....	11	13
Northumberland and Durham	8	11	7	30	1	.....	.....	.....	3	1	14	13
Ontario	5	12	4	13	1	.....	.....	.....	8	1	18	26
Oxford	9	26	1	10	6	4	.....	.....	6	12	22	52
Parry Sound	8	15	7	10	2	2	.....	.....	2	4	19	31
Peel	8	10	1	16	7	1	.....	.....	1	1	18	27
Perth	14	21	2	4	2	2	.....	.....	2	4	20	31
Peterborough	20	26	4	8	10	7	1	.....	9	4	44	45
Prescott and Russell	8	14	2	2	2	.....	.....	.....	.....	.....	12	16
Prince Edward	7	10	1	.....	.....	.....	.....	.....	1	2	9	12
Rainy River	8	7	.....	31	.....	10	.....	.....	.....	.....	8	48
Renfrew	14	19	2	1	.....	.....	.....	.....	6	.....	22	20
Simcoe	17	22	2	14	.....	.....	.....	1	14	7	33	44
Stormont, Dundas and Glengarry	21	29	4	6	3	.....	.....	.....	8	5	36	40
Sudbury	19	62	34	48	2	.....	.....	.....	4	8	59	118
Thunder Bay	21	44	13	17	3	2	.....	.....	14	18	51	81
Victoria	2	7	1	5	1	.....	.....	.....	3	2	7	14
Waterloo	17	26	2	3	4	.....	.....	.....	4	6	27	35
Welland	20	31	2	12	3	2	.....	.....	6	2	31	47
Wellington	12	20	4	.....	1	.....	.....	.....	3	5	20	25
Wentworth	49	57	3	61	12	7	1	.....	21	6	86	131
York	10	24	.....	321	1	.....	.....	.....	8	3	19	348
Toronto	281	450	53	.....	54	10	.....	3	89	46	477	509
Totals	944	1,119	278	1,159	217	70	6	10	374	291	1,815	3,019

by the different Sheriffs for the year ending 31st December, 1910.

Number of persons served.		Estreats received.		Number of jurors summoned.		Number of writs of execution received.			Number of renewals of writs of execution against— Goods and Lands.		
H.C.	C.C.	H.C.	C.C.	H.C.	C.C.	H.C.	C.C.	D.C.	H.C.	C.C.	D.C.
27	146	.....	.....	117	78	8	23	19	9	17	.....
28	158	1	.....	122	122	27	19	11	3	2	.....
48	38	.....	.....	122	122	14	22	13	4	4	.....
200	219	.....	.....	219	122	36	77	16	8	11	.....
13	21	.....	.....	122	120	11	4	13	1	.....	.....
38	90	.....	.....	122	122	22	26	16	1	.....	.....
51	140	.....	.....	122	122	21	13	22	4	3	.....
26	76	.....	.....	122	98	12	16	11	5	.....	.....
12	15	.....	1	122	123	27	27	19	2	3	.....
60	101	.....	.....	122	218	12	14	7	4	.....	.....
26	40	.....	.....	122	98	4	9	8	2	.....	.....
80	169	.....	.....	122	122	16	17	19	9	3	.....
51	184	.....	.....	112	112	23	22	10	2	.....	.....
28	45	.....	.....	117	111	5	21	.....	2	5	.....
33	49	.....	.....	112	112	18	14	20	5	3	2
44	57	.....	.....	122	122	6	7	15	4	1	.....
52	47	.....	.....	119	116	5	9	16	.....	.....	.....
47	222	.....	.....	122	218	7	23	30	.....	2	.....
29	8	.....	.....	112	98	3	6	3	.....	1	.....
64	66	.....	.....	122	98	14	11	21	.....	.....	.....
4	9	.....	.....	61	98	.....	10	.....	.....	1	.....
112	196	.....	.....	183	122	34	30	22	1	.....	.....
58	76	.....	.....	122	122	11	13	6	.....	.....	.....
104	75	.....	.....	134	86	81	180	42	1	.....	.....
20	24	.....	.....	122	122	5	5	10	.....	.....	.....
14	11	.....	.....	122	122	21	13	17	5	.....	.....
86	71	.....	.....	122	122	39	8	3	3	3	.....
43	57	.....	.....	122	122	18	23	14	1	.....	4
35	64	.....	.....	122	122	6	15	10	3	3	.....
31	67	.....	.....	122	122	3	5	1	3	2	.....
40	65	.....	.....	122	122	30	15	11	.....	1	.....
138	92	.....	.....	122	122	14	12	13	5	4	.....
48	33	.....	.....	122	122	10	12	24	.....	.....	.....
15	14	.....	.....	121	122	5	9	3	.....	.....	.....
8	45	.....	.....	61	73	5	7	.....	.....	.....	.....
21	25	.....	.....	122	122	9	7	19	3	.....	.....
37	143	.....	.....	106	106	16	23	22	2	7	.....
61	68	.....	.....	183	98	14	20	13	3	4	.....
57	115	.....	.....	120	96	5	28	4	2	.....	.....
127	159	.....	.....	129	130	16	93	54	6	8	.....
13	64	.....	.....	98	98	8	16	15	4	2	.....
39	39	.....	.....	122	120	28	16	9	7	2	.....
44	103	.....	.....	122	122	22	28	33	1	4	.....
45	45	.....	.....	122	122	14	14	10	.....	1	.....
150	331	.....	.....	183	122	30	54	38	8	11	.....
21	1716	.....	.....	.....	293	45	21	9	19	.....	.....
635	518	.....	.....	339	.....	174	1	86	82	65	.....
2,963	6,116	1	1	5,920	5,604	954	1,058	777	224	173	6

APPENDIX A.—Containing in tabulated form Statistics as returned by the

Counties or Districts.	Number of renewals of writs of execution against—					Number of writs of possession received.		Number of writs Ca. Sa.	
	Lands only.			Goods only.					
	H.C.	C.C.	D.C.	H.C.	C.C.	H.C.	C.C.	H.C.	C.C.
Algoma			8						
Brant							1		
Bruce			1			1			
Carleton			3			1	4		
Dufferin									
Elgin			2						
Essex			4				2		
Frontenac							1		
Grey								1	
Haldimand									
Halton									
Hastings	1	5				1	1		
Huron							1	1	
Kenora			1						
Kent			2						
Lambton			4			1	1		
Lanark									
Leeds and Grenville						1			
Lennox and Addington							1		
Lincoln			1						
Manitoulin									
Middlesex							1		
Muskoka									
Nipissing						8	2		
Norfolk			1			1			
Northumberland and Durham			2			2	1		1
Ontario			7			1			
Oxford			4			2	1		
Parry Sound			4						
Peel			3						
Perth						1			
Peterborough			4						
Prescott and Russell									
Prince Edward	1								
Rainy River									
Renfrew						2			
Simcoe			2			1			
Stormont, Dundas and Glengarry			3						
Sudbury									
Thunder Bay			3			1			
Victoria			6						
Waterloo							1		
Welland			1			2			
Wellington			1			1	1		
Wentworth			13			3			
York			1			5			
Toronto	1		5			13	4		1
Totals	3	5	86			48	23	2	2

different Sheriffs for the year ending 31st December, 1910.—*Continued.*

Number of sales under writs of execution of					Seizures under writs of execution where no subsequent sale.			Attendance to seize where no goods found.		Writs of execution on which money realized.		
Goods.		Lands.										
H.C.	C.C.	H.C.	C.C.	D.C	H.C.	C.C.	D.C.	H C.	C.C.	H.C.	C C.	D.C.
1	.....	1	2	1	.....	.....	2	1	.....	2	2	1
.....	1	.....	.....	.....	16	6	.....	7	.....	14	6	1
.....	1	.....	.....	.....	4	2	.....	4	2	7	7	3
1	.....	.....	.....	.....	3	19	.....	1	3	2	17	1
.....	.....	.....	.....	.....	3	.....	.....	3	.....	3	.....	.....
.....	1	.....	.....	.....	3	7	.....	.....	3	2	4	1
.....	2	.....	.....	.....	9	6	1	3	.....	11	7	5
1	1	.....	.....	2	7	4	.....	.....	.....	8	4	1
1	1	1	.....	.....	6	7	.....	14	12	9	8	.....
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	9	10	.....
2	1	.....	.....	.....	.....	.....	.....	.....	2	1	3	5
1	.....	.....	.....	.....	4	5	2	1	7	2	8	6
.....	.....	.....	.....	.....	6	12	.....	5	2	6	12	.....
.....	1	.....	1	.....	.....	3	.....	.....	1	.....	2	.....
.....	1	1	1	.....	7	6	.....	2	1	10	3	.....
.....	.....	.....	.....	.....	1	4	.....	2	2	1	6	4
.....	.....	.....	.....	.....	.....	2	.....	1	3	2	3	.....
1	.....	1	.....	.....	4	5	7	1	3	6	5	7
.....	.....	.....	.....	1	1	.....	.....	1	2	3	2	2
2	.....	.....	.....	.....	1	.....	.....	.....	.....	2	2	.....
.....	2	.....	.....	.....	.....	2	.....	.....	1	.....	2	.....
.....	.....	.....	.....	.....	.....	.....	.....	6	4	.....	.....	.....
.....	1	.....	.....	.....	3	2	.....	.....	.....	3	2	.....
10	19	.....	.....	.....	9	18	.....	5	8	10	15	.....
.....	.....	.....	.....	.....	.....	2	.....	.....	.....	4	.....	1
.....	1	1	.....	.....	.....	3	.....	.....	.....	4	6	.....
.....	1	1	.....	.....	25	1	.....	8	.....	27	2	.....
2	.....	.....	.....	.....	.....	6	.....	4	1	8	5	2
1	.....	.....	.....	.....	.....	2	.....	1	6	1	1	.....
.....	.....	.....	.....	.....	1	2	.....	1	.....	1	2	.....
.....	1	1	.....	.....	5	3	.....	8	3	13	6	6
.....	.....	.....	.....	.....	2	3	.....	.....	.....	.....	1	.....
.....	.....	.....	.....	.....	.....	3	.....	.....	.....	8	2	.....
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	.....
.....	.....	.....	.....	.....	1	.....	.....	.....	1	1	4	.....
.....	1	.....	.....	1	1	3	.....	1	1	6	2	4
.....	1	.....	1	1	2	10	.....	1	13	1	8	2
1	.....	.....	.....	.....	1	9	.....	.....	.....	3	3	1
2	1	.....	.....	.....	.....	.....	.....	.....	.....	5	11	.....
.....	3	1	.....	.....	1	16	.....	2	5	9	16	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	5	1
.....	.....	.....	.....	.....	5	1	.....	9	4	9	4	.....
2	.....	1	.....	.....	11	3	6	1	3	14	13	6
.....	.....	.....	.....	.....	1	3	1	1	1	7	3	1
1	1	1	.....	.....	9	7	.....	7	4	7	7	3
.....	.....	.....	.....	.....	6	1	.....	10	2	23	2	.....
4	3	.....	.....	.....	.....	.....	.....	.....	.....	13	30	14
34	45	10	5	7	158	188	19	111	100	283	263	82

APPENDIX A.—Containing in tabulated form Statistics as returned by the

Counties or Districts.	Cases under Creditors' Relief Act.	Certificates received under Creditors' Relief Act.	Assignments made to Sheriff under 10 Edw. VII., cap. 64.	Returns received under 9 Edw. VII., cap 89, sec. 37.	Sales of Lands under 9 Edw. VII., cap. 89, sec. 37.	Amount endorsed on Writs of Execution (not renewals). For debt or damages H C.	C.C.	Div. Co.	For costs taxed. H.C.	C.C.
						$ c.	$ c	$ c.	$ c.	$ c.
Algoma	1	....	....	4	....	10,852 42	7,348 51	1,888 88	495 05	676 23
Brant	....	....	....	....	....	13,222 91	6,757 88	892 98	483 04	455 24
Bruce	1	1	....	....	....	2,838 90	4,011 67	1,108 68	1,273 53	1,074 00
Carleton	1	1	....	....	....	119,158 69	25,354 84	1,759 22	5,132 19	1,863 15
Dufferin	....	....	....	....	....	5,263 03	1,562 30	1,578 67	231 74	175 60
Elgin	1	....	2	....	....	28,285 10	8,458 29	1,543 24	3,229 99	963 24
Essex	3	....	3	....	....	14,356 05	3,253 81	2,227 12	1,037 38	374 28
Frontenac	....	....	....	....	....	43,469 24	4,500 32	1,250 01	173 57	429 57
Grey	1	....	....	....	....	11,598 14	7,836 62	1,971 13	875 51	662 25
Haldimand	....	....	....	....	....	514 80	3,355 99	647 17	136 00	381 78
Halton	3	2	....	....	....	4,550 65	2,132 87	905 87	570 24	303 47
Hastings	2	....	3	....	....	121,468 54	4,500 22	1,802 59	1,113 44	631 51
Huron	....	....	....	....	....	40,829 37	6,415 72	1,198 00	775 94	469 99
Kenora	2	....	1	....	....	39,599 11	9,018 82	108 14	122 12	528 32
Kent	3	2	1	....	....	7,074 58	4,122 07	2,154 28	263 92	243 74
Lambton	....	....	....	....	....	5,279 13	1,503 66	1,644 60	522 17	391 24
Lanark	....	....	....	....	....	66,726 40	2,212 21	1,402 33	1,080 83	381 65
Leeds & Grenville	2	....	1	....	....	5,741 01	6,865 65	3,270 47	160 74	563 89
Lennox & Addington	3	....	2	....	....	6,187 30	1,529 49	374 06	51 42	131 62
Lincoln	....	....	....	....	....	42,793 06	3,870 02	2,237 61	2,237 61	1,149 74
Manitoulin	....	....	1	....	....	.....	3,497 60	59 18	.....	278 96
Middlesex	....	....	....	....	....	20,966 44	8,784 55	2,284 47	814 32	481 43
Muskoka	....	....	....	....	....	3,574 84	4,953 27	447 59	309 17	309 57
Nipissing	33	4	....	....	....	155,870 40	42,365 29	4,585 77	5,053 66	5,229 90
Norfolk	....	....	....	....	....	133 75	961 23	668 27	54 75	69 96
Northumberland and Durham	....	....	....	....	....	17,558 57	3,764 64	1,250 67	1,083 32	401 36
Ontario	2	....	....	....	....	25,615 42	1,768 37	326 15	686 84	151 26
Oxford	1	2	1	....	....	5,658 55	9,657 04	1,101 82	198 32	551 51
Parry Sound	....	....	3	12	....	21,447 45	3,518 79	1,929 41	576 09	468 54
Peel	....	....	....	....	....	978 10	1,289 94	106 25	92 80	94 41
Perth	2	1	1	....	....	33,736 14	2,920 18	1,008 36	1,707 51	585 40
Peterborough	....	....	....	....	....	22,266 83	3,662 37	1,713 29	817 63	422 28
Prescott & Russell	....	....	1	....	....	3,676 82	3,929 76	1,805 97	89 72	171 51
Prince Edward	1	3	....	....	....	1,855 65	2,773 69	394 61	29 56	275 11
Rainy River	....	....	....	....	....	3,060 57	2,085 67	.....	92 06	117 20
Renfrew	....	....	....	....	....	4,068 08	1,790 61	1,661 26	401 90	182 70
Simcoe	2	7	....	....	....	15,264 50	8,477 40	1,878 46	722 14	1,682 75
Stormont, Dundas and Glengarry	1	1	1	....	....	53,642 51	5,724 48	794 13	338 66	624 24
Sudbury	....	....	3	....	....	1,227 42	7,737 71	601 49	121 04	653 77
Thunder Bay	8	4	3	....	....	17,035 59	33,276 88	14,513 35	686 87	2,523 59
Victoria	....	....	....	....	....	715 00	4,650 26	1,422 06	264 14	939 53
Waterloo	....	....	....	....	....	36,161 70	5,011 40	639 04	484 74	317 12
Welland	3	3	1	....	....	18,377 86	7,581 44	2,935 46	484 81	458 91
Wellington	....	1	....	....	....	1,909 41	4,247 53	932 49	416 24	429 77
Wentworth	4	....	2	....	....	27,187 09	16,154 26	2,667 70	1,715 22	1,317 16
York	....	....	....	....	....	28,174 48	4,992 73	643 59	1,227 03	498 29
Toronto	9	....	....	....	....	547,208 07	92,661 48	7,865 53	19,941 91	8,082 06
Totals	89	32	30	16	....	1,657,179 67	402,849 53	84,201 42	58,376 88	39,168 80

different Sheriffs for the year ending 31st December, 1910.—Concluded.

	Amounts realized under writs of execution from sales of					Amount received for fines, penalties, etc.	Amount received (not fees) under Fi. Fas. without sale, goods and lands.		
	Goods.		Lands.						
Div. C.	H.C.	C.C.	H.C.	C.C.	Div. C.		H.C.	C.C.	Div. C.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
153 21	152 13	.....	50 00	20 00	20 00	.....	.....	725 28	273 88
52 27	.....	313 25	.....	.....	.....	50 00	1,349 98	992 95	.....
98 73	.....	140 00	.....	.....	.....	.....	2,191 87	896 91	366 41
.....	1,207 23	.....	.....	.....	.....	.....	1,070 79	3,753 66	139 78
118 70	.....	.....	.....	.....	.....	.....	284 13	.....	226 24
176 21	.....	266 90	.....	.....	.....	.....	189 20	1,011 40	82 00
310 65	.....	50 77	.....	.....	.....	.....	4,667 63	537 15	281 09
33 27	.....	.....	.....	145 00	60 00	.....	3,560 75	452 19	166 23
151 88	405 00	27 00	584 84	.....	.....	44 10	643 80	1,581 29	.....
43 88	.....	.....	.....	.....	94 95	25 00	538 00	2,199 04	.....
46 20	1,360 70	.....	.....	.....	.....	.....	.....	186 82	446 19
129 40	144 88	.....	.....	.....	.....	.....	204 50	1,732 03	442 19
38 25	.....	.....	.....	.....	.....	75 00	2,133 94	2,395 38	.....
.....	.....	72 00	.....	400 00	.....	.....	475 00	1,280 02	.....
50 72	.....	185 14	150 00	165 00	.....	30 00	3,121 78	308 79	.....
96 40	.....	.....	.....	.....	.....	.....	45 50	1,142 42	509 46
76 91	.....	.....	.....	.....	.....	.....	158 31	359 46	.....
209 60	888 80	.....	150 00	.....	.....	.....	539 95	1,347 65	900 05
13 58	.....	.....	.....	.....	20 29	.....	233 47	353 38	.....
249 09	154 13	420 25	.....	.....	.....	.....	107 48	677 75	.....
3 20	.....	421 30	.....	.....	.....	.....	.....	670 92	.....
135 21	.....	.....	.....	.....	.....	200 00	1,905 13	1,902 94	484 50
23 94	.....	105 75	.....	.....	.....	.....	88 60	283 93	.....
248 05	749 00	3,038 30	.....	.....	.....	.....	.....	.....	.....
31 98	.....	.....	.....	.....	.....	.....	117 40	.....	105 75
89 92	.....	34 00	.....	.....	.....	.....	164 00	1,376 65	173 77
5 36	.....	90 00	3,675 00	.....	.....	161 00	1,242 12	16 21	.....
85 29	240 55	.....	.....	.....	.....	.....	627 36	1,292 00	108 90
58 71	1,525 00	.....	.....	.....	.....	.....	52 25	126 00	.....
7 62	.....	.....	.....	.....	.....	.....	.....	187 34	.....
79 11	.....	76 31	1,300 00	.....	.....	.....	4,531 71	1,530 03	432 36
117 09	.....	.....	.....	.....	.....	.....	.....	140 00	.....
215 17	.....	.....	.....	.....	.....	.....	223 80	400 84	.....
24 99	225 95	.....	.....	.....	.....	.....	749 11	1,180 29	.....
.....	.....	.....	.....	.....	.....	12,050 00	282 16	1,337 46	.....
65 74	.....	15 74	.....	.....	101 47	.....	876 13	36 94	267 23
179 40	.....	962 03	.....	30 00	263 55	.....	251 15	1,482 83	161 98
29 24	30 00	.....	.....	.....	.....	.....	517 88	1,052 79	.....
23 97	110 00	12 70	.....	.....	.....	.....	.....	1,723 84	.....
305 32	575 00	420 00	210 00	.....	.....	.....	3,164 31	3,809 29	649 23
123 97	.....	.....	.....	.....	.....	.....	137 95	459 74	61 70
18 03	.....	.....	.....	.....	.....	.....	1,061 56	301 54	.....
.....	314 75	.....	2,000 00	.....	.....	.....	978 46	424 36	290 81
34 51	.....	.....	.....	.....	.....	.....	534 26	324 13	136 50
356 09	365 70	218 21	549 50	.....	.....	.....	1,564 64	605 06	250 67
49 36	.....	.....	.....	.....	.....	2,646 00	1,444 10	69 00	.....
505 40	1,868 25	823 50	.....	.....	.....	.....	5,767 52	5,382 30	1,133 57
4,865 62	10,317 07	7,693 15	8,669 34	760 00	560 26	15,281 10	47,797 68	50,050 00	8,090 49

APPENDIX B.—Being a return of business transacted by Local Masters through

County or District.	Number of Orders made for the following purposes:					Examinations taken as special examiner or otherwise before trial.
	For administration of estates.	For partition or sale of property.	Respecting Infants under R.S.O., c. 168, s. 3. (Examination only).	Under Winding-up Acts.	Other Orders made in chambers.	
Algoma				1	66	
Brant						
Bruce					1	
Carlton				6	85	59
Dufferin					25	
Elgin						8
Essex						5
Frontenac		2			5	1
Grey					29	
Haldimand						
Halton		1				
Hastings,	1				26	12
Huron						
Kenora		1		1	4	10
Kent		2			2	1
Lambton		2			8	
Lanark						
Leeds and Grenville	2					11
Lennox and Addington					1	
Lincoln						
Manitoulin		1				
Middlesex		2				
Muskoka						
Nipissing					2	
Norfolk					5	
Northumberland and Durham					2	
Ontario	1			1	3	1
Oxford						19
Parry Sound						
Peel						14
Perth	1	1		2	5	
Peterborough				3	38	
Prescott and Russell						
Prince Edward					9	
Rainy River						11
Renfrew						
Simcoe					1	
Stormont, Dundas and Glengarry				10	41	
Sudbury						
Thunder Bay		1		1		
Victoria		1			2	
Waterloo		1				1
Welland		1		1		
Wellington				5	23	6
Wentworth				1	3	
Totals	5	16		32	386	159

out the Province of Ontario during the year ending 31st December, 1910.

Number of Judgments or Orders brought into the Master's Office for taking the following accounts, etc.

Administration of estates.	Executors, trustees or committees' accounts and compensation.	Foreclosure of mortgage or bond.	Redemption of mortgage or bond.	Sale under mortgage or agreement.	Account on any charge or liens on lands other than mechanics' liens.	Account under Mechanics' Lien Act.	Specific performance.	Partnership accounts.	Alimony.	Partition or sale.	Damages for breach of contract or covenant.
.....	.....	12	.....	.....	1	6	.....	.....	.....	.....	.....
.....	.....	1	.....	.....	.....	1	.....	1	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	9	.....	3	.....	6	5	2	.....	2	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
.....	.....	3	.....	2	.....	.....	.....	.....	.....	5	.....
.....	.....	4	.....	1	.....	.....	.....	1	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
1	.....	1	.....	.....	.....	3	.....	.....	.....	.....	.....
1	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....
.....	.....	3	.....	1	.....	.....	.....	.....	.....	.....	.....
1	.....	2	.....	1	.....	.....	.....	.....	1	.....	.....
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	2	1	.....	.....	1	.....	1	1	1	.....
.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
2	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	1	1	.....	.....	.....	1	2
1	.....	1	.....	.....	.....	.....	.....	.....	.....	2	.....
1	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	5	.....	3	.....	.....	.....	1	1
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
.....	1	1	.....	1	.....	6	.....	1	.....	.....	.....
17	11	49	2	15	2	27	7	8	2	20	6

APPENDIX B.—Being a return of business transacted by Local Masters through

County or District.	Number of Judgments or Orders.—*Con*						
	Work and labor done.	Money received, paid, advanced, or lent.	Goods sold and delivered.	Promissory notes and bills of exchange.	Bonds, life and fire insurance.	Infants' estates.	Quieting Title matters.
Algoma							
Brant							
Bruce							
Carlton	3	2					
Dufferin							
Elgin		1					
Essex							
Frontenac							
Grey	2	1	1				1
Haldimand							
Halton							
Hastings							
Huron			1				
Kenora					1		
Kent	1						
Lambton							
Lanark							
Leeds and Grenville							
Lennox and Addington							
Lincoln							
Manitoulin							
Middlesex						1	6
Muskoka							
Nipissing							
Norfolk							
Northumberland and Durham							
Ontario							
Oxford	1						1
Parry Sound							
Peel							
Perth							
Peterborough							
Prescott and Russell							
Prince Edward							
Rainy River							
Renfrew							
Simcoe							3
Stormont, Dundas & Glengarry			2				
Sudbury							
Thunder Bay	3		1			1	
Victoria							
Waterloo							
Welland							
Wellington		1					1
Wentworth	1						
Totals	11	5	5		1	2	12

out the Province of Ontario during the year ending 31st December, 1910.

tinued.

Lunacy.	Miscellaneous.	Number of advertisements of sale issued.	Number of reports issued.	Number of references pending at date of return.	Number of bills of cost taxed by Master.	Amount realized by sales held under direction of Master.	Amount of costs of reference, etc., taxed by Master or under his direction.	Amount of commission allowed in administration and partition matters.
						$ c.	$ c.	$ c.
2	.....	.....	.....	.....	4	.....	272 36	.....
.....	.....	.....	.....	.....	.....	.....	49 33	.....
1	.....	.....	3	1	2	.....	125 54	.....
.....	2	3	16	10	19	2,695 00	4,231 72	459 00
.....	.....	.....	1	.....	2	.....	241 00	.....
.....	1	3	9	.....	.....	12,213 00	.....	.....
2	.....	.....	6	.....	.....	.....	191 25	.....
1	.....	4	6	3	4	23,375 00	200 82	130 00
.....	.....	2	10	1	8	3,600 00	847 07	.....
2	.....	.....	3	1	1	.....	51 00	.....
.....	.....	1	3	2	.....	.....	.....	110 50
.....	3	.....	5	7	6	1,000 00	1,001 93	112 00
4	.....	1	4	11	10	25,094 00	1,318 13	590 00
.....	1	1	4	3	2	.....	275 00	.....
.....	.....	1	1	5	1	1,600 00	.....	.....
.....	.....	2	1	2	.....	3,955 00	58 74	203 74
.....	.....	1	6	1	9	4,950 00	636 06	.....
1	2	2	13	10	4	5,991 15	404 79	.....
.....	1	.....	1	.....	1	.....	461 50	.....
.....	.....	1	2	3	2	4,065 00	197 88	158 10
.....	.....	.....	1	.....	3	450 00	290 87	.....
2	2	2	9	12	2	5,475 00	275 85	378 49
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	1	1	.....	.....	8,000 00	.....	.....
.....	.....	.....	1	1	.....	.....	.....	.....
1	.....	.....	1	1	2	.....	.....	.....
3	.....	3	4	1	3	3,060 00	236 87	300 00
3	.....	.....	4	1	.....	10,000 00	.....	375 00
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	.....	1	.....	1	.....	186 70	.....
.....	3	2	6	8	3	2,100 00	635 00	.....
.....	.....	2	2	3	1	25,000 00	750 00	.....
.....	1	.....	2	.....	.....	2,332 00	.....	.....
2	.....	.....	5	1	6	.....	121 94	663 53
.....	.....	.....	.....	2	7	.....	.....	.....
1	1	.....	.....	1	.....	.....	.....	.....
2	3	1	2	3	.....	.....	.....	.....
2	4	.....	4	10	.....	1,100 00	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	1	1	8	.....	335 00	.....	.....
2	.....	2	9	1	7	7,430 00	526 40	383 00
1	3	4	4	5	3	.....	220 71	.....
.....	1	4	.....	5	.....	.....	.....	.....
.....	.....	.....	3	2	.....	690 00	.....	165 15
1	1	1	11	6	1	.....	.....	.....
33	32	45	165	131	115	154,510 15	13,808 46	4,028 51

APPENDIX C.—A return of all business transacted by Local Registrars, 31st Dec

County or District.	Writs of summons issued.	Orders for arrest issued.	Actions entered in Procedure Book.			*Praecipe* orders issued.	Orders issued and signed by Local Judge.	Examination of parties returned.	Records passed.	Actions entered for Trial.		Actions tried.		Remanets standing for Trial	
			Writs issued during year.	Writs issued during previous years.	Otherwise than by Writ.					By Jury.	Without Jury.	By Jury.	Without Jury.	By Jury.	Without Jury.
Algoma	43	....	30	2	5	19	46	3	8	3	6	1	3	....	....
Brant	34	....	30	2	1	23	11	11	16	6	10	3	9	....	1
Bruce	31	....	23	....	2	10	19	6	6	4	3	4	3	....	....
Carlton	182	....	159	4	18	80	52	71	38	12	32	8	25	....	....
Dufferin	8	....	5	....	4	2	1	1	1	4	1	2	....	....	....
Elgin	65	....	56	....	5	55	13	21	8	4	8	1	9	....	....
Essex	74	1	65	5	12	29	50	39	31	13	19	5	17	1	3
Frontenac	46	....	24	....	10	12	31	1	6	2	2	1	3	....	....
Grey	80	....	63	4	2	37	11	24	33	16	14	7	14	1	2
Haldimand	17	....	18	0	0	0	6	1	10	4	3	....	2	....	....
Halton	12	....	11	3	6	8	4	....	5	2	4	2	2	....	....
Hastings	55	....	45	1	....	38	12	16	24	21	17	1	14	3	1
Huron	52	....	47	2	3	31	19	12	20	10	9	1	10	1	2
Kenora	17	....	15	3	8	16	23	5	5	....	4	....	4	....	....
Kent	51	....	34	2	2	36	54	....	22	7	13	3	16	....	1
Lambton	41	....	32	....	2	18	11	6	10	4	5	1	5	....	....
Lanark	22	....	10	1	1	2	21	6	4	2	2	....	2	....	1
Leeds and Grenville	37	....	30	2	....	11	1	20	8	3	5	3	5	....	....
Lennox and Addington	17	....	16	....	1	4	7	4	6	2	3	2	3	....	....
Lincoln	29	....	26	....	4	32	14	16	9	4	9	8	2	....	....
Manitoulin	2	....	1	....	1	1	....	....	....	....	....	....	....	....	....
Middlesex	138	....	93	3	19	85	59	64	45	29	22	23	13	2	8
Muskoka	8	....	7	....	1	2	3	4	3	3	....	1	....	1	....
Nipissing	161	....	118	11	120	61	116	26	56	20	38	7	17	2	5
Norfolk	18	....	15	....	....	12	5	11	10	6	8	2	2	....	....
Northumberland and Durham	34	....	22	2	4	12	10	14	8	10	5	8	5	....	....
Ontario	18	....	15	2	3	3	2	2	1	1	1	2	1	....	....
Oxford	51	....	33	....	2	32	12	14	16	13	3	6	9	2	2
Parry Sound	10	....	10	1	2	5	5	....	1	1	....	1	....	....	....
Peel	17	....	11	....	2	13	5	13	5	9	1	7	1	....	1
Perth	84	....	75	3	0	63	56	....	....	23	29	....	....	....	....
Peterborough	36	....	27	4	11	26	1	33	10	5	5	2	2	....	....
Prescott and Russell	14	....	9	1	....	7	13	4	3	2	3	....	2	2	....
Prince Edward	9	....	4	....	1	4	2	4	2	1	2	2	....	....	....
Rainy River	8	....	6	....	2	9	18	1	6	....	6	....	5	....	1
Renfrew	28	....	21	3	3	....	12	3	6	4	5	2	4	....	....
Simcoe	85	....	54	1	....	27	20	9	20	11	12	4	16	....	....
Stormont, Dundas and Glengarry	61	....	45	4	7	27	3	....	27	3	24	3	24	....	3
Sudbury	37	....	34	24	9	12	15	....	8	....	10	....	6	....	1
Thunder Bay	107	....	105	7	29	57	131	53	31	10	26	10	26	....	....
Victoria	19	....	14	4	1	27	13	2	5	1	3	....	3	....	....
Waterloo	59	....	45	6	21	30	37	68	19	3	27	....	13	....	3
Welland	63	....	55	1	12	21	25	12	23	12	13	6	21	....	....
Wellington	41	....	28	3	1	8	2	3	6	4	4	3	3	....	....
Wentworth	163	....	129	10	18	104	63	53	78	46	29	29	24	1	1
Totals	2184	1	1715	121	355	1111	1034	656	659	340	445	171	345	16	36

Deputy Registrars and Deputy Clerks of the Crown for the year ending ember, 1910.

Judgments entered without trial.	Amount of such judgments, without costs.	Amount of costs taxed thereunder (exclusive of Disbursements).	Amount of disbursements allowed.	Judgments entered after trial.	Amount of such judgments, without costs.	Amount of costs taxed thereunder (exclusive of Disbursements).	Amount of disbursements allowed.	Number of Judgments for over $10,000.	Number of Judgments for $10,000 and above $5,000.	Number of Judgments for $5,000 and above $2,000.	Number of Judgments for $2,000 and above $1,000.
	$ c.	$ c.	$ c.		$ c.	$ c.	$ c.				
7	33,590 39	135 75	53 22	5	13,512 61	329 95	76 38	1	1	3	3
7	11,584 80	257 88	51 20	4	2,469 03	.....	.....	....	1	....	5
4	904 45	80 50	31 20	3	2,486 52	133 40	364 09	....	....	1	....
69	137,301 22	1,052 08	330 40	31	37,889 93	1,701 32	703 35	4	8	9	24
1	.....	77 40	22 51	1	150 00	.....	.....	....	....	....	....
19	64,279 25	395 23	101 09	13	11,211 48	1,976 31	352 34	1	1	9	10
12	13,913 17	374 45	102 35	19	9,214 33	2,039 44	1,186 83	....	....	4	3
9	9,414 29	248 86	58 78	2	433 14	312 22	167 04	....	....	1	2
15	26,422 23	260 88	64 56	14	7,114 92	989 18	1,083 29	1	....	4	4
2	2,146 45	40 60	17 56	1	750 00	250 00	.....	....	....	....	1
2	4,260 74	35 43	12 99	2	190 00	.....	.....	....	....	1	1
7	97,132 14	146 80	42 72	14	7,814 48	989 88	278 08	1	....	3	1
8	14,770 74	233 84	80 64	6	3,103 00	1,515 49	505 56	....	....	5	2
5	6,646 25	109 30	37 46	2	33,041 98	.....	.....	1	....	....	....
2	1,682 00	130 22	120 91	4	2,081 63	621 16	1,192 20	....	....	....	1
3	90 00	65 63	14 39	6	10,164 53	352 57	80 59	....	1	....	1
7	2,693 83	85 00	34 73	3	.....	99 20	258 78	....	....	....	1
12	10,978 50	392 15	140 94	7	48,891 33	1,160 89	639 74	1	....	1	8
6	8,310 91	112 94	39 78	3	259 00	392 96	80 31	....	....	2	1
5	3,781 80	91 43	29 33	7	6,655 90	1,105 58	495 88	....	....	1	3
....	.....	.....	.....	1	.....	.....	.....	....	....	....	....
21	50,546 21	602 86	347 02	14	17,487 29	179 10	327 34	3	....	4	7
2	812 50	68 90	14 21	1	5,775 00	176 70	132 81	....	1	....	....
42	60,216 95	799 20	166 96	42	30,248 35	2,103 86	812 74	1	....	7	30
2	7,846 17	24 71	7 81	1	300 00	.....	.....	....	1	....	....
4	566 35	138 42	7 47	7	9,591 09	400 00	10 22	....	....	2	....
7	10,805 90	213 94	15 92	2	.....	.....	.....	....	1	1	2
6	3,928 42	152 80	186 32	9	11,446 90	896 07	1,024 14	....	....	2	2
3	30,563 01	94 54	.....	2	15 75	.....	.....	1	....	....	1
2	2,725 00	357 97	118 23	3	629 95	53 27	159 82	....	....	1	....
13	7,123 05	124 60	43 43	11	16,635 04	1,559 74	845 00	1	....	2	7
13	11,839 96	312 32	129 29	5	4,500 00	735 60	515 56	....	....	1	4
2	1,253 02	19 80	5 26	2	.....	.....	.....	....	....	....	1
2	1,469 65	69 70	36 90	1	180 00	76 35	64 16	....	....	....	....
1	.....	.....	.....	5	180 39	65 00	.....	....	....	....	....
10	11,981 79	234 27	165 28	3	11,200 00	39 90	53 62	....	1	1	....
9	19,299 92	213 39	43 02	8	4,576 85	216 06	126 45	1	....	1	5
15	16,015 80	253 72	91 21	17	8,137 34	1,764 84	274 21	....	....	6	3
6	9,768 50	139 20	62 22	4	1,647 06	330 69	265 53	....	....	2	4
13	19,817 23	413 99	118 80	20	29,759 24	1,623 93	931 31	1	....	6	4
6	50 00	43 40	14 20	3	145 75	62 43	75 69	....	....	....	....
18	50,796 64	194 31	47 99	6	7,589 98	549 50	75 52	....	5	5	3
17	9,017 92	184 00	36 80	6	3,357 02	416 35	481 22	....	....	1	3
6	20,663 62	161 20	31 18	6	3,648 02	.....	.....	1	1	2	....
34	36,847 61	856 85	195 79	32	73,961 39	4,523 81	1,314 73	....	3	5	12
456	833,858 38	10,000 46	3,272 07	358	438,446 22	29,742 75	14,954 53	19	25	93	159

APPENDIX C.—A return of all business transacted by Local Registrars, 31st Dec

County or District.	Number of Judgments for $1,000 and above $400.	Number of Judgments for $400 and under.	Number of Judgments dismissing actions.	Number of Judgments in default of appearance or pleading.	Number of Judgments under Con. Rule 603.	Number of Judgments for reference to Master.	Number of Writs of Execution issued.	Number of Writs of Execution renewed.	No. of Writs of *Ca. Sa.* issued.	Number of Certificates issued under Creditors' Relief Act.	Amount for which issued, without costs.	Amount of Costs allowed thereunder (including Disbursements).
											$ c.	$ c.
Algoma	1	....	1	4	3	....	2	5	....	....	.....	.....
Brant	....	1	3	1	4	....	7	2	....	....	.....	.....
Bruce	1	1	....	4	....	....	4	....	....	....	.....	.....
Carlton	4	5	13	24	6	17	37	14	....	....	.....	.....
Dufferin	....	2	....	....	....	....	3	4	....	....	.....	.....
Elgin	3	8	1	11	6	....	21	1	....	....	.....	.....
Essex	5	5	7	6	2	1	15	3	....	....	.....	.....
Frontenac	4	....	1	....	2	8	4	....	....	....	.....	.....
Grey	6	2	5	10	2	6	10	2	....	....	.....	.....
Haldimand	1	....	....	2	....	....	0	2	....	....	.....	.....
Halton	....	2	....	2	....	....	3	....	....	....	.....	.....
Hastings	4	4	....	2	....	5	8	6	....	....	.....	.....
Huron	2	5	2	4	4	1	9	3	....	....	.....	.....
Kenora	....	1	....	5	....	1	3	2	....	....	.....	.....
Kent	3	2	2	2	....	2	2	2	....	....	.....	.....
Lambton	....	6	4	3	1	....	5	4	....	....	.....	.....
Lanark	2	....	1	2	....	4	....	....	....	....	.....	.....
Leeds and Grenville	4	5	....	20	....	5	5	....	....	....	.....	.....
Lennox and Addington	....	6	....	5	....	1	5	2	....	....	.....	.....
Lincoln	4	3	....	....	....	1	6	....	....	....	.....	.....
Manitoulin	....	....	....	....	....	....	....	....	....	....	.....	.....
Middlesex	4	2	5	13	1	4	18	2	....	....	.....	.....
Muskoka	1	....	....	1	....	0	1	....	....	....	.....	.....
Nipissing	12	11	7	25	7	2	46	1	....	....	.....	.....
Norfolk	1	2	....	2	....	1	....	....	....	....	.....	.....
Northumberland and Durham	3	2	....	3	....	1	3	4	....	....	.....	.....
Ontario	1	....	2	4	....	1	4	1	....	....	.....	.....
Oxford	2	4	....	1	4	1	5	1	....	....	.....	.....
Parry Sound	....	....	1	3	....	....	3	....	....	....	.....	.....
Peel	1	3	....	....	....	....	2	1	....	....	.....	.....
Perth	9	15	....	10	5	6	....	....	....	....	.....	.....
Peterborough	7	....	1	10	2	1	11	1	....	....	.....	.....
Prescott and Russell	....	3	....	2	....	1	....	1	....	....	.....	.....
Prince Edward	....	1	....	2	....	....	....	....	....	....	.....	.....
Rainy River	....	1	3	1	....	2	1	....	....	....	.....	.....
Renfrew	....	1	1	....	....	....	3	1	....	....	.....	.....
Simcoe	9	2	2	6	....	....	9	7	....	....	.....	.....
Stormont, Dundas and Glengarry	5	9	1	11	1	7	7	1	....	....	.....	.....
Sudbury	1	1	1	5	....	....	2	....	....	....	.....	.....
Thunder Bay	9	3	3	8	5	6	9	5	....	....	.....	.....
Victoria	....	2	....	2	....	5	2	3	....	....	.....	.....
Waterloo	2	....	....	7	2	5	12	....	....	....	.....	.....
Welland	6	13	3	4	13	2	3	....	....	2	488 00	12 00
Wellington	1	....	2	5	1	2	3	1	....	....	.....	.....
Wentworth	13	33	7	15	7	4	45	15	....	....	.....	.....
Totals	131	166	79	247	78	103	338	97	....	2	488 00	12 00

Deputy Registrars and Deputy Clerks of the Crown for the year ending ember, 1910.—Continued.

Number of days of sitting of Judge with Jury, H.C.J.	Number of days of sitting of Judge without Jury, H.C.J.	Number of Estreats ordered to be issued.	Number of Estreats issued.	Amount of Jury fees paid County or Provincial Treasurer.	Amount of money paid into Court with defence.	Amount of money paid out of Court.	Amount of fees collected in law stamps for the Shorthand Reporters' Fund.	Fees collected in law stamps by Deputy Clerks and Local Registrars.	Fees collected in law stamps by Deputy Registrars.
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
2	4	.....	....	9 00	765 00	.....	18 00	181 80	.....
2½	3½	.....	....	18 00	1,550 05	....	32 00	193 80	.....
10	3	.....	....	9 00	.....	.....	12 00	163 40	.....
8	18	.....	....	36 00	2,481 25	.....	88 00	314 90	300 00
4	.....	.....	....	12 00	.....	....	10 00	47 30	.....
5	5	.....	....	12 00	.....	.....	24 00	328 70	.....
6	13	.....	....	39 00	.....	.....	64 00	527 50	.....
6	4	.....	....	6 00	.....	.....	14 00	171 90	.....
15	4	.....	....	48 00	1,550 00	.....	60 00	362 90	.....
3	.....	.....	....	12 00	.....	.....	14 00	73 90	.....
3	2	.....	....	6 00	.....	.....	12 00	86 00	.....
11	3	.....	....	39 00	225 95	.....	60 00	96 10	280 50
7	3	.....	....	30 00	180 80	.....	38 00	217 50	.....
1	3	.....	....	.....	.....	.....	10 00	148 40	.....
7	5	.....	....	21 00	.....	.....	40 00	377 10	.....
6	5	.....	....	12 00	.....	.....	18 00	266 70	.....
.....	5	.....	....	6 00	.....	.....	8 00	143 70	..... :
6	3	.....	....	12 00	.....	.....	16 00	228 40	.....
4	2	.....	....	6 00	109 00	.....	10 00	113 20	.....
8	5	.....	....	9 00	200 00	.....	30 00	226 90	.....
.....	.....	.....	....	.....	469 40	.....	.....	8 70	.....
19	8	.....	....	87 00	3,506 05	200 00	94 00	128 30	174 30
4	4	.....	....	9 00	.....	.....	6 00	53 90	.... ..
11	6	.....	....	60 00	86 63	.....	116 00	1,054 00	.....
4	3	.....	....	15 00	.....	.....	22 00	122 80	.....
8	3	.....	....	24 00	.....	.....	16 00	173 30	.....
9	5	.....	....	3 00	1,000 00	.....	4 00	83 20	.....
10	3	.....	....	39 00	800 00	.....	46 00	110 30	38 50
3	.....	.....	....	.....	.....	.....	2 00	59 30	.....
7	4	.....	....	24 00	.....	.....	18 00	99 80	.....
.....	.....	.....	....	87 00	.....	.....	104 00	590 20	.....
9	6	.....	....	15 00	.....	.....	20 00	280 70	.....
.....	7	.....	....	6 00	.....	.....	10 00	79 95	.....
.....	8	.....	....	3 00	886 00	886 00	6 00	56 00	.....
.....	3	.....	....	.....	.....	.....	12 00	93 50	.....
3	4	.....	....	12 00	.....	.....	18 00	136 60	.....
22	7	.....	....	24 00	5,740 00	.....	40 00	338 70	.....
13	5	.....	....	9 00	.....	.....	54 00	358 80	.....
4	.....	.....	....	.....	.....	.....	16 00	181 45	.....
10	11	.....	....	30 00	.....	.....	66 00	699 46	.....
2	2	.....	....	3 00	.....	.....	[8 00	104 30	.....
12	.....	.....	....	6 00	.....	.....	48 00	337 20	.....
8	3	.....	....	36 00	69 98	.....	48 00	569 20	.....
10	4	.....	....	12 00	372 00	.....	16 00	215 90	.....
23	10	.....	....	138 00	1,067 76	.....	150 00	989 50	14 60
305½	196½	.....	....	984 00	21,059 87	1,086 00	1,518 00	11,195 16	807 90

APPENDIX D.—Being a return of business transacted by County Court Clerks

County or District.	Writs of summons issued.	Orders for arrest issued.	Actions entered in Procedure Book. (a) Writs issued during the year.	(b) Do. previous year.	(c) Otherwise than by Writ.	*Pracipe* orders issued.	Orders issued and signed by Local Judge.	Examination of Parties returned.	Records passed.	Actions entered for Trial by Jury.	Actions entered for Trial without Jury.	Number of actions tried by Jury.	Number of actions tried without Jury.	Number of Remanets standing for Trial by Jury.
Algoma	35	..	26	2	....	18	36	4	9	....	10	....	5	....
Brant	79	..	59	3	4	15	16	11	10	8	4	2	5	....
Bruce	59	..	41	....	4	15	41	7	9	5	4	2	5	....
Carlton	233	..	180	12	....	59	74	37	34	10	23	5	18	....
Dufferin	14	..	12	1	1	10	12	12	8	4	4	2	4	....
Elgin	68	..	54	2	....	25	8	19	19	9	3	2	6	1
Essex	57	..	45	1	12	14	.....	16	14	6	10	....	14	2
Frontenac	52	..	39	1	4	6	18	11	7	2	4	....	5	1
Grey	68	..	46	8	....	15	.....	11	14	4	10	2	10	....
Haldimand	30	..	21	....	....	7	12	15	8	2	6	2	4	....
Halton	13	..	15	....	....	10	7	1	6	2	5	....	4	1
Hastings	79	..	58	2	6	35	33	18	27	16	15	7	9	1
Huron	74	..	67	2	5	19	13	5	13	6	7	2	10	1
Kenora	36	..	30	5	2	19	28	3	7	....	7	....	6	....
Kent	67	..	51	1	....	39	17	....	18	5	13	4	10	....
Lambton	46	..	37	2	18	13	19	8	13	8	5	5	6	1
Lanark	35	..	17	1	2	4	14	12	9	1	8	1	7	....
Leeds & Grenville	49	..	41	4	....	9	.....	18	10	4	6	2	7	....
Lennox & Addington	16	1	14	2	....	10	9	3	7	2	4	1	5	....
Lincoln	40	..	34	....	1	22	18	9	8	4	7	4	6	....
Manitoulin	22	..	22	1	3	5	21	....	3	....	3	....	2	....
Middlesex	156	..	115	4	18	57	61	47	31	16	17	12	11	....
Muskoka	21	..	18	2	....	9	15	7	1	2	....	1	1	....
Nipissing	453	..	339	16	4	65	178	21	60	11	51	....	40	....
Norfolk	14	..	11	....	....	7	2	3	2	1	1	....	2	....
Northumberland and Durham	39	..	25	1	....	9	42	5	2	1	1	1	1	....
Ontario	20	..	16	....	5	7	8	3	3	....	3	....	2	....
Oxford	44	..	36	3	3	12	24	23	7	6	1	5	....	....
Parry Sound	22	..	22	6	....	4	2	3	3	1	2	1	2	....
Peel	12	..	9	....	5	6	7	2	3	1	2	1	2	....
Perth	73	..	59	2	2	28	16	....	....	7	12	....	....	....
Peterborough	39	..	27	0	3	27	25	17	12	3	9	2	7	....
Prescott and Russell	15	..	11	....	....	2	9	3	2	3	1	2	2	....
Prince Edward	12	..	12	1	....	8	10	9	6	....	6	....	6	....
Rainy River	25	..	24	....	3	15	10	....	5	1	5	1	3	....
Renfrew	55	..	41	6	....	....	23	4	6	4	6	3	3	....
Simcoe	81	..	52	1	....	23	26	22	17	10	7	10	6	....
Stormont, Dundas and Glengarry	75	..	50	3	1	26	21	....	16	4	14	3	11	....
Sudbury	88	..	68	47	....	11	34	....	17	1	16	....	8	....
Thunder Bay	170	..	153	7	....	18	166	9	16	4	15	2	12	2
Victoria	41	..	25	3	....	32	11	12	9	4	5	2	4	....
Waterloo	73	..	55	3	....	27	24	22	10	5	6	1	3	....
Welland	45	..	37	4	....	4	25	5	9	3	7	....	9	....
Wellington	36	..	26	....	....	10	10	5	7	1	6	....	5	....
Wentworth	199	..	165	6	10	55	61	20	31	16	15	10	12	2
York	1,511	1	1,093	54	5	506	691	122	288	66	222	65	212	6
Totals	2,491	2	3,398	219	121	1337	1,897	584	816	269	588	165	512	18

throughout the Province of Ontario for the year ending 31st December, 1910.

Number of Remanets standing for Trial without Jury.	Number of Judgments entered without Trial.	Total amount of such Judgments without costs.	Total amount of Costs taxed thereunder (exclusive of Disbursements).	Total amount of Disbursements allowed.	Number of Judgments entered after Trial.	Total amount of such Judgments without costs.	Total amount of Costs taxed thereunder (exclusive of Disbursements).	Total amount of Disbursements allowed.	Number of Judgments $400 and under.	Number of Judgments dismissing actions.	Number of Judgments in default of appearance or pleading.	Number of Judgments under Con. Rule 603.
		$ c.	$ c.	$ c.		$ c.	$ c.	$ c.				
....	11	3,137 30	171 40	63 07	6	2,065 26	327 18	295 00	15	....	7	5
2	30	8,934 09	476 80	276 42	4	532 65	44 87	39 89	29	3	23	5
....	18	5,701 12	274 84	23 10	13	1,813 90	642 49	627 47	31	3	18	....
2	87	30,278 12	1,020 10	466 93	17	3,561 66	737 52	465 43	103	7	74	10
....	3	773 84	39 25	10 53	4	491 73	270 50	161 17	7	....	2	1
2	21	6,687 73	263 62	90 67	6	998 47	448 69	216 06	27	3	13	9
....	18	6,610 81	337 05	86 38	9	763 00	392 37	177 39	22	3	16	1
....	24	9,722 17	433 86	107 14	4	874 34	388 28	220 72	27	1	18	5
1	15	5,315 20	146 35	49 40	6	1,052 00	173 47	226 90	19	4	14	....
....	3	417 90	49 00	15 96	2	300 00	199 17	129 11	2	....	2	....
2	3	1,110 40	34 75	13 96	2	145 34	99 15	50 02	4	2	3	....
4	16	5,533 45	192 79	67 83	7	538 13	298 24	180 33	18	2	15	1
....	31	9,661 78	689 56	263 51	5	1,160 75	801 08	463 72	36	....	25	7
....	19	9,153 85	311 89	103 07	5	2,559 58	85 60	70 62	18	1	18	1
4	11	3,886 03	131 10	55 17	4	380 37	125 00	70 00	3	11	1	7
....	5	1,380 31	67 90	22 17	9	2,659 58	588 07	402 13	14	....	5	1
....	7	1,613 40	94 56	39 07	8	696 60	277 94	264 55	13	1	6	1
....	22	7,288 00	469 45	146 42	3	603 14	269 33	177 87	25	3	17	4
....	7	2,504 42	79 85	28 09	2	407 25	123 66	104 53	9	....	7	....
1	10	4,288 58	261 41	77 16	1	240 00	.....	.....	....	....	....	....
....	12	3,804 60	466 16	101 30	3	535 47	157 76	52 71	3	....	9	....
....	47	12,187 22	7,381 91	213 36	12	1,167 17	522 04	335 47	59	8	47	4
....	10	3,911 21	1,211 25	54 75	1	150 00	73 40	44 51	....	....	7	2
2	152	47,016 78	1,803 36	419 53	27	5,757 34	1,217 00	1,195 25	169	6	122	30
....	3	443 78	33 47	9 17	....	.....	.....	.....	2	....	3	....
....	12	3,779 27	157 66	53 84	2	175 00	120 23	66 77	12	1	12	....
....	3	724 40	31 20	15 78	....	.....	.....	.....	3	....	2	....
....	22	8,318 08	344 71	173 91	4	838 81	124 30	185 30	26	1	13	9
....	13	3,352 53	207 31	29 23	2	2 50	.....	.....	13	....	13	....
....	2	427 53	33 35	15 69	2	508 98	.....	.....	2	....	2	....
....	20	5,444 19	237 12	87 87	9	1,618 05	396 98	473 85	29	1	17	3
2	13	4,902 85	167 28	64 29	5	2,270 00	398 62	545 36	14	1	10	2
....	7	2,208 82	101 35	44 50	2	93 09	31 08	140 70	9	....	7	....
....	3	1,487 02	33 15	11 43	6	1,617 59	431 05	218 07	8	1	3	....
2	1	.....	65 00	.....	3	590 00	140 00	27 60	2	1	1	....
....	21	5,135 06	328 39	188 76	3	478 62	46 25	14 80	24	....	21	....
1	23	7,611 78	358 54	119 49	3	.....	.....	.....	25	1	23	....
5	21	6,948 92	283 25	114 58	8	994 02	895 10	442 51	29	11	18	3
3	29	8,964 95	456 27	173 72	9	1,598 63	280 33	232 27	16	1	....	....
3	81	24,347 19	1,194 69	277 27	6	1,357 15	182 43	104 59	87	2	60	15
1	8	2,370 70	125 55	36 89	6	884 65	366 43	555 28	11	3	7	....
1	23	6,312 88	552 19	217 67	6	1,539 79	399 39	143 52	27	....	21	2
....	13	3,741 50	193 58	60 70	8	1,053 95	330 15	281 81	21	5	12	1
1	11	5,125 20	208 80	53 25	7	1,137 13	664 39	379 63	18	1	9	2
6	79	24,543 55	1,402 51	407 23	14	1,801 38	1,184 96	538 81	93	5	55	17
20	525	156,815 36	6,689 10	2,047 56	149	22,346 31	7,113 20	2,123 51	674	47	387	130
65	1515	473,923 87	29,612 68	6,997 82	414	70,359 38	21367 70	12445 23	1798	140	1165	278

APPENDIX D.—Being a return of business transacted by County Court Clerks

County or District.	Number of Judgments for reference to Master.	Writs of Execution issued.	Number of Writs of Execution renewed.	Number of Writs of Ca. Sa. issued.	Number of Certificates issued under Creditors' Relief Act.	Amount for which issued without Cost.	Amount of Costs allowed thereunder (including Disbursements).	Number of days of sittings of County Court.	Amount of Jury Fees paid County or Provincial Treasurers.	Amount of money paid into Court with defence.
						$ c.	$ c.		$ c.	$ c.
Algoma	....	13	10	....	....	.....	.....	4	.....	.....
Brant	1	20	1	....	....	.....	.....	9	12 00	520 00
Bruce	....	17	....	....	1	115 00	5 72	9	7 50	5 00
Carlton	2	82	17	....	....	.....	.....	34	15 00	978 99
Dufferin	....	3	....	....	....	.....	.....	7	6 00	200 30
Elgin	1	18	1	....	....	.....	.....	10	13 50	48 00
Essex	1	14	1	....	....	.....	.....	14	9 00	.....
Frontenac	....	24	1	....	1	29 80	6 50	4	3 00	.....
Grey	....	15	1	....	....	.....	.....	15	6 00	300 00
Haldimand	....	....	....	....	....	.....	.....	5	3 00	5 00
Halton	....	4	....	....	....	.....	.....	4	3 00	.....
Hastings	1	14	4	....	....	.....	.....	16	21 00	60 50
Huron	....	29	2	....	....	.....	.....	19	9 00	330 00
Kenora	....	22	4	....	2	1,944 90	.....	3	.....	.....
Kent	....	7	4	....	2	1,105 00	15 00	10	7 50	100 41
Lambton	....	6	....	....	....	.....	.....	10	12 00	24 55
Lanark	....	7	....	....	....	.....	.....	7	1 50	262 50
Leeds and Grenville	....	20	....	....	....	.....	.....	6	7 50	.....
Lennox and Addington	....	8	3	....	....	.....	.....	4	3 00	101 00
Lincoln	....	8	1	....	....	.....	.....	7	6 00	65 00
Manitoulin	....	5	....	....	....	.....	.....	7	.....	.....
Middlesex	....	42	1	....	....	.....	.....	22	24 00	24 30
Muskoka	....	8	....	....	....	.....	.....	2	.....	.....
Nipissing	...	110	....	....	4	1,510 57	43 65	25	18 00	615 77
Norfolk	....	3	....	....	....	.....	.....	2	1 50	.....
Northumberland and Durham	....	6	2	....	....	.....	.....	4	1 50	.....
Ontario	....	2	1	....	....	.....	.....	4	.....	3,733 55
Oxford	....	20	1	....	1	130 15	6 00	9	9 00	.....
Parry Sound	....	8	....	....	....	.....	.....	5	1 50	.....
Peel	....	2	1	....	....	.....	.....	6	1 50	.....
Perth	....	....	2	....	....	.....	.....	....	10 50	.....
Peterborough	....	10	2	....	....	.....	.....	14	4 50	185 00
Prescott and Russell	....	7	....	....	....	.....	.....	9	3 00	1,195 10
Prince Edward	....	3	....	....	....	.....	.....	8	.....	142 40
Rainy River	....	3	....	....	....	.....	.....	4	1 50	300 00
Renfrew	....	8	....	....	....	.....	.....	9	6 00	.....
Simcoe	....	20	2	....	7	890 00	163 58	20	15 00	424 56
Stormont, Dundas and Glengarry	....	20	17	....	....	.....	.....	25	6 00	154 10
Sudbury	....	18	....	....	....	.....	.....	6	1 50	34 20
Thunder Bay	....	67	16	....	....	.....	.....	24	6 00	155 00
Victoria	....	7	....	....	....	.....	.....	9	6 00	.....
Waterloo	1	20	2	....	....	.....	.....	8	6 00	187 83
Welland	...	12	1	....	....	.....	.....	4	4 50	.....
Wellington	....	11	....	....	....	.....	.....	9	1 50	.....
Wentworth	....	77	11	....	....	.....	.....	19	24 00	954 61
York	2	498	90	....	....	.....	.....	157	99 00	2,376 58
Totals	9	1318	199	....	18	5,725 42	240 45	608	397 50	13,484 25

in the Province of Ontario for the year ending 31st December, 1910.—Concluded.

Amount of money paid out of Court.	Number of Partition Matters.	Amount of money paid thereunder.	Amounts paid out.	Amount of moneys in Court in County Court matters, including interest (under Con. Rule 1221).	Number of Chattel Mortgages and Bills of Sale filed.	Total amount secured by such mortgages.	Number of mortgages renewed.	Number of discharges filed.	Number of assignments for benefit of creditors.	Number of Hire Receipts, etc., filed under R.S.O., 1897, Cap. 149.	Total amount secured by such Receipts, etc.	Amount of fees collected in law stamps under Section 42 of the Creditors' Relief Act.
$ c.		$ c.	$ c.	$ c.		$ c.					$ c.	
.....	..	..	.....	.....	169	1,041,805 27	62	12	5	130	28,759 26	.....
524 71	..	....	.....	654 43	184	329,146 10	89	9	4	168	38,190 66	.....
.....	..	....	.....	371 10	219	78,303 00	154	6	6	69	12,416 10	.....
3,760 52	..	....	.....	.....	191	143,365 16	198	17	36	558	60,518 28	.....
230 30	..	..	.....	.....	49	19,393 89	51	1	7	91	10,226 23	.....
.....	..	....	.....	556 72	405	326,439 40	145	7	9	148	23,360 68	.....
6,105 51	..	....	.....	.....	300	95,752 80	150	12	8	114	19,532 82	.....
.....	..	..	.....	.....	333	180,002 76	131	11	4	501	49,711 11	.....
320 56	..	....	.....	.....	542	5,399,329 93	116	6	10	223	41,107 36	.....
100 00	..	....	.. ...	5 11	102	26,152 93	45	2	3	35	28,385 72	.....
.....	..	....	.....	.....	50	35,609 00	36	3	3	36	35,461 90	.....
200 00	..	....	.....	231 62	361	8,275,037 11	207	7	11	119	34,230 02	.....
330 00	..	...	225 61	191 39	129	89,506 09	117	12	5	79	26,572 81	.....
.....	..	....	.....	.....	34	31,220 38	5	5	1	12	4,115 50	1 50
433 07	..	....	.....	121 91	418	178,207 00	290	18	10	949	94,846 90	3 00
24 55	..	....	.....	400 00	203	1,179,255 71	238	4	3	91	14,421 20	.....
262 50	..	....	.....	.....	75	31,538 95	64	3	4	48	10,394 63	.....
.....	..	....	.....	82 75	191	68,125 53	126	3	8	71	12,691 38	.....
101 00	..	....	.....	.....	80	5,052,768 58	100	8	3	112	7,960 15	.....
300 00	..	....	.....	.....	119	57,822 71	63	11	2	171	22,145 00	.....
.....	..	..	.....	.....	86	18,550 10	41	3	2	12	1,687 40	.....
593 72	..	....	.....	.....	347	282,333 55	145	12	18	188	47,184 95	.....
.....	..	....	.....	.....	166	94,947 62	55	7	3	30	9,593 38	.....
956 15	..	..	.....	257 11	399	2,729,749 60	88	19	52	155	78,705 25	7 50
.....	..	....	.....	460 65	157	62,696 41	139	7	6	187	16,080 84	.....
167 40	..	....	.....	28,245 90	246	597,467 53	207	14	4	86	107,253 03	.....
.....	..	....	.....	100 00	109	55,621 38	106	9	1	48	10,960 14	.....
71 35	..	....	.....	2,344 17	153	68,124 09	86	11	8	118	33,114 51	80
.....	..	....	.. ...	.....	214	1,803,268 28	48	6	4	54	19,706 76	.....
.....	..	....	.....	100 00	72	280,521 00	33	3	2	21	4,003 00	.....
.....	..	....	.....	.....	202	270,314 19	50	4	6	100	24,634 49	.....
145 00	.	...	.....	838 57	163	5,192,093 15	89	12	5	78	16,789 36	.....
1,155 48	..	....	.....	67 71	146	114,459 42	55	7	3	24	12,959 25	.....
142 40	..	....	.....	300 00	71	32,946 46	54	9	2	23	3,206 99	.....
200 00	..	....	.....	100 00	58	9,818 95	9	3	1	75	16,288 59	.....
.....	..	....	.....	8 40	135	118,495 86	136	7	11	55	11,222 49	.....
181 00	..	....	.....	243 56	625	619,650 16	257	3	8	173	40,447 38	.....
7 10	..	....	.....	157 00	207	157,007 35	90	16	15	293	20,262 14	.....
34 20	..	....	.....	40 43	177	503,228 31	55	6	4	....	.....	.....
30 00	..	.. .	.....	225 00	140	457,893 06	21	14	10	836	113,110 12	.....
.....	..	....	.....	.....	167	243,306 54	68	5	2	38	10,996 50	.....
110 00	..	....	.....	130 15	133	174,699 82	89	9	10	205	56,055 18	.....
.....	..	....	.....	.....	259	5,289,967 38	96	13	9	80	209,362 80	.....
25 00	..	.	.....	2,178 40	262	188,829 40	123	4	8	129	20,529 39	.....
805 35	..	....	.....	641 26	324	656,749 60	309	15	24	218	100,959 92	.....
17827 62	..	....	.....	56,935 47	928	1,790,983 00	496	100	121	1587	949,906 00	.....
35,144 49	..	....	225 61	95,988 81	101 20	44,452,504 51	5332	475	481	8538	2,510,067 67	12 80

APPENDIX E.—Being a return of business transacted by Surrogate Registrars

County or District.	Total number of Probates issued.	Total number of Letters of Administration issued.	Total number of Letters of Guardianship issued.	Total number of Probates and Letters of Administration issued under 10 Edw. VII., C. 31, s. 73, ss. 1.	Total number of Probates and Letters issued under 10 Edw. VII., C. 31, s. 73, ss. 4.	Number of Wills proved istration or Guardianship alty valued as			
						$100,000, or over.	From $50,000 to $100,000.	From $25,000 to $50,000.	From $10,000 to $25,000.
Algoma	32	25	6	6	17	.....	.....	1	2
Brant	79	45	9	9	20	.....	1	1	11
Bruce	148	47	1	16	27	2	1	.....	6
Carlton	158	106	5	20	33	4	1	6	20
Dufferin	43	16	2	7	6	.....	1	1	1
Elgin	102	64	6	20	15	.....	2	2	3
Essex	105	81	5	73	45	.....	.....	2	3
Frontenac	86	31	.....	25	11	1	2	1	8
Grey	150	53	1	16	24	.....	.....	1	6
Haldimand	51	29	3	5	12	.....	1	.....	4
Halton	60	17	.....	6	13	.....	1	.....	2
Hastings	112	68	5	17	30	.....	.....	1	7
Huron	160	71	5	19	25	.....	.....	2	8
Kenora	5	12	1	5	5	.....	.....	.....	.....
Kent	130	37	5	24	30	.....	.....	2	2
Lambton	99	54	4	15	21	1	1	2	10
Lanark	78	32	.....	10	14	1	.....	4	4
Leeds and Grenville	89	47	2	4	12	1	1	2	5
Lennox and Addington	43	16	2	7	4	.....	1	2	1
Lincoln	73	40	.....	6	21	.....	.....	.....	4
Manitoulin	6	5	1	.....	3	.....	.....	.....	.....
Middlesex	253	137	10	108	79	.....	2	4	21
Muskoka	25	11	3	3	3	.....	.....	.....	.....
Nipissing	22	54	3	1	15	.....	.....	1	4
Norfolk	67	34	3	16	22	.....	.....	1	3
Northumberland	145	65	2	21	37	.....	1	.....	10
Ontario	96	49	2	14	20	.....	.....	1	6
Oxford	132	52	1	18	20	1	1	3	17
Parry Sound	17	13	.....	.....	.....	.....	.....	.....	.....
Peel	66	35	4	31	11	.....	.....	1	7
Perth	122	52	3	.....	.....	.....	.....	.....	.....
Peterborough	83	36	1	14	11	.....	.....	1	3
Prescott and Russell	59	21	.....	4	11	.....	.....	.....	2
Prince Edward	56	26	.....	8	11	.....	.....	1	3
Rainy River	8	7	.....	7	1	.....	.....	.....	.....
Renfrew	53	26	3	6	13	.....	1	1	3
Simcoe	138	82	6	79	39	.....	.....	3	8
Stormont, Dundas and Glengarry	96	39	3	10	19	1	1	1	10
Sudbury	9	22	1	.....	.....	.....	.....	1	.....
Thunder Bay	17	28	1	5	8	1	.....	.....	5
Victoria	59	21	2	6	10	.....	.....	3	.....
Waterloo	152	47	2	18	23	.....	2	4	14
Welland	82	53	2	18	20	.....	.....	1	8
Wellington	174	54	2	18	37	1	.....	.....	3
Wentworth	191	108	3	27	40	3	4	3	18
York	653	504	25	210	141	17	20	25	79
Totals	4,584	2,472	145	952	979	34	45	85	231

throughout the Province of Ontario during the year ending 31st December, 1910.

and Letters of Administration issued where person- follows:				Total amount of personalty devolving.	Total amount of realty to be administered under 10 Edw. VII., C, 56, s. 3.	Amount of moneys in Court in Surrogate matters, including interest, Con. Rule 1,221.	Amount earned for.		
From $5,000 to $10,000.	From $1,000 to $5 000.	From $400 to $1,000.	$400 and under.				Registrar's fees.	Judge's fees.	Fee fund.
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
2	13	18	27	115,575 41	71,010 17	.....	510 40	260 00	160 50
8	40	32	40	445,722 18	334,904 67	.....	1,453 54	683 25	413 00
17	74	43	53	1,129.202 00	381,701 73	.....	2,012 71	1,738 75	899 60
18	97	53	70	1,922,779 81	14,292 43	.....	2,649 61	2,391 50	1,432 60
3	25	7	23	237,077 13	225,241 54	.....	750 55	396 50	222 80
16	78	25	46	559,968 24	406,039 52	.....	1,763 33	1,010 00	576 00
12	55	45	74	382,495 00	549,315 10	8 01	1,746 27	836 00	499 20
8	46	26	25	621,206 31	319,058 00	.....	1,265 44	898 80	503 60
16	92	46	43	474,401 16	495,880 88	.....	2,190 52	984 50	607 20
5	35	11	27	247,788 62	138,385 33	124 80	930 20	480 15	277 20
8	32	13	21	313,854 41	243,936 00	.....	762 40	414 90	262 00
17	72	42	46	432,164 00	53,565 00	.....	2,141 10	864 40	512 70
17	113	40	56	601,831 03	103,916 57	.....	2,532 85	1,051 30	679 40
2	6	5	5	33,754 91	8,940 00	.....	153 99	63 00	52 50
9	62	35	62	918,593 00	19,954 00	.....	1,258 00	675 50	464 50
8	51	41	43	497,251 87	338,785 14	235 00	1,562 40	1,112 50	647 50
7	54	20	20	640,205 04	273,828 00	.....	1,253 00	827 25	504 60
13	71	30	15	2,726,641 00	51,825 00	.....	1,959 30	3,075 90	1,605 50
9	27	9	12	268,126 10	140,440 00	.....	720 72	561 90	228 50
13	39	23	27	259,155 50	270,479 00	.....	1,283 46	986 10	333 70
.....	4	3	5	7,228 00	9,915 00	.....	97 02	30 00	22 60
23	159	83	112	1,272,966 09	972,954 31	.....	4,003 42	2,077 50	1,314 10
1	20	5	13	52,913 06	85,744 00	.....	360 00	130 25	98 10
5	16	18	35	122,226 43	49,394 00	.....	600 00	339 75	206 30
7	30	21	42	204,201 32	151,155 26	451 36	1,108 37	464 00	272 80
21	71	61	48	546,072 82	45,284 57	.....	2,187 50	1,051 75	653 50
22	59	15	33	428,641 51	351,300 68	.....	1,646 89	900 70	463 20
15	61	31	56	957,811 19	585,062 66	7,678 88	2,369 05	1,494 80	746 30
1	8	6	15	29,015 00	19,075 00	.....	202 35	78 75	59 20
11	44	11	31	301,414 00	282,273 00	.....	1,283 01	590 95	310 00
.....	.....	.....	.....	.....	.....	.....	1,974 80	937 00	630 30
15	44	25	32	287,565 70	214,835 16	.....	1,376 50	772 75	339 60
11	37	14	16	216,838 78	202,451 00	.....	856 34	346 50	245 60
8	33	17	12	226,862 93	191,218 64	.....	934 26	497 05	246 90
.....	7	1	7	10,702 72	23,918 92	.....	114 12	45 50	20 10
6	31	21	19	297,546 52	101,436 55	.....	802 40	481 00	331 80
12	86	38	79	568,835 36	449,451 35	.....	2,176 86	950 50	643 90
14	55	22	34	585,205 20	52,100 00	.....	1,938 81	1,150 90	531 50
1	8	11	11	63,958 14	81,002 00	.....	250 08	128 25	86 60
3	12	4	21	265,582 80	204,991 28	.....	446 79	350 80	211 40
4	59	10	6	214,804 98	188,366 00	.....	1,000 67	492 20	250 70
24	78	32	47	874,312 31	431,209 62	.....	2,057 65	1,282 25	772 90
8	48	27	45	333,620 99	255,791 90	.....	1,056 00	622 25	394 40
23	97	44	62	596,041 00	428,339 00	.....	2,217 74	1,185 25	690 00
27	87	59	101	1,813,119 66	958,325 07	602 70	3,142 88	2,896 50	1,404 80
95	333	226	387	9,470,613 00	3,981,332 00	.....	11,993 59	12,061 50	6,659 60
565	2,569	1,369	2,004	32,575,892 23	14,758,425 05	9,100 75	75,096 89	50,670 85	28,488 80

APPENDIX F.—Return of fees and emoluments of County Judicial Officers throughout the officers payable by the Province, the County and the

County and Town.	Office.	Officer	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			$ c.	$ c.	$ c.	$ c.
ALGOMA: Sault Ste. Marie ..	Sheriff	W. H. Carney ...	1,925 55	1,000 00	2,925 55	2,391 93
	Surrogate Judge ..	Judge Johnston..	.....	*500 00	645 40	645 40
	Local Master	" ..	145 40	.....	.....	.....
	Crown Attorney...	M.McFadden K.C.	1,297 11	400 00	2,200 60	1,368 11
	Clerk of the Peace.	" ..	503 49	.....	.....	263 49
	Local Registrar...	C. V. Plummer..	81 49	150 00	1,665 04	198 45
	District Court Cl'k	" ..	323 15	600 00	.....	773 15
	SurrogateRegistrar	" ..	510 40	.....	.....	510 40
BRANT: Brantford.	Sheriff	W. W. Ross	2,179 42	.....	2,179 42	1,482 40
	Surrogate Judge...	Judge Hardy....	Commuted	682 00	706 30	682 00
	Local Master.....	" ...	24 30	.....	.....	14 30
	Crown Attorney .	A. J. Wilkes, K.C.	1,659 04	.....	2,636 29	1,326 54
	Clerk of the Peace	"	977 25	.....	.....	624 52
	Local Registrar...	J. T. Hewitt.....	155 44	675 00	2,883 81	830 44
	County Court Cl'k.	"	599 94	.....	.....	599 94
	SurrogateRegistrar	"	1,453 43	.....	.....	1,453 43
BRUCE: Walkerton	Sheriff	†D. M. Jermyn .	2,291 76	.....	2,291 76	1,842 03
	Surrogate Judge...	Judge Barrett...	1,000 00	.....	1,000 00	.....
	Local Master	Judge Klein.....	Commuted	400 00	.....	.....
	Crown Attorney...	Thomas Dixon ..	195 64	.....	1,452 74	131 20
	Clerk of the Peace	" ..	1,257 10	.....	.....	889 09
	Local Registrar. .	Matthew Goetz..	132 95	675 00	3,436 68	807 95
	County Court Cl'k	" ..	616 02	.....	.....	289 06
	SurrogateRegistrar	" ..	2,012 71	.....	.....	1,522 26
CARLTON: Ottawa ..	Sheriff	G. C. Richardson.	6,511 20	.....	6,511 20	5,439 25
	Surrogate Judge...	Judge McTavish.	1,300 00	.....	1,300 00	.....
	" ...	Judge Gunn.....	1,000 00	.....	1,000 00	.....
	Local Master	John Bishop, K.C.	1,510 70	.....	2,147 50	1,510 70
	Deputy Registrar..	"	636 80	.....	.....	636 80
	Crown Attorney...	J. A. Ritchie	469 08	.....	1,292 03	296 08
	Clerk of the Peace.	"	822 95	.....	.....	391 27
	Deputy Clerk of the Crown.....	J. P. Featherston.	239 52	450 00	4,860 63	689 52
	County Court Cl'k.	"	1,521 50	.....	.....	1,521 50
	SurrogateRegistrar	"	2,649 61	.....	.....	2,649 61
DUFFERIN: Orangeville	Sheriff	Thomas Bowles.	1,218 44	.....	1,218 44	815 27
	Surrogate Judge ..	Judge McCarthy.	396 50	.....	468 68	396 50
	Local Master	"	72 18	.....	.....	1 70
	Crown Attorney...	W. J. L. McKay .	383 17	.....	932 22	356 00
	Clerk of the Peace.	"	549 05	.....	.....	232 15
	Local Registrar...	J. A. V. Preston.	34 45	675 00	1,807 10	709 45
	County Court Cl'k.	"	347 10	.....	.....	335 60
	SurrogateRegistrar	"	750 55	.....	.....	745 50
ELGIN. St. Thomas	Sheriff	Dugald McColl .	2,093 07	.....	2,093 07	1,679 84
	Surrogate Judge..	Judge Colter....	1,000 00	.....	1,000 00	.....
	Local Master	C. F. Maxwell. .	383 36	.....	383 36	258 76
	Crown Attorney...	A. McCrimmon..	1,158 15	.....	2,074 63	702 50
	Clerk of the Peace.	" ..	916 48	.....	.....	577 93
	Local Registrar...	David McLaws..	265 45	675 00	3,348 43	758 50
	County Court Clerk	"	644 65	.....	.....	524 35
	SurrogateRegistrar	"	1,763 33	.....	.....	1,640 68

*By 10 Edw. VII. Cap. 26, Sec. 13. †Appointed 24th November.

Province of Ontario for the year ending 31st December, 1910, and of total earnings of such General Public, respectively, for the same period.

Total received for past years' services	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under 10 Edw. VII., cap. 5.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
408 70	2,800 63	1,699 69	1,100 94	.....	1,100 94	2,405 00	.....	520 51	Algoma.
150 00	795 40	.....	795 40	.....	795 40	500 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	145 40	
197 45	2,063 61	262 80	1,800 81	.....	1,800 81	1,656 07	.....	41 04	
234 56	.....	.....	.....	.....	.....	492 95	.....	10 54	
25 00	1,607 00	298 40	1,308 60	.....	1,308 60	150 00	.....	81 49	
100 00	.....	.....	.....	.....	.....	600 00	.....	323 15	
.....	.....	.....	.....	.....	.....	.....	.....	510 40	
538 78	2,021 18	311 03	1,710 15	.....	1,710 15	1,089 41	538 61	551 40	Brant.
.....	696 30	.....	696 30	.....	696 30	682 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	24 30	
413 58	2,738 68	507 75	2,230 93	23 09	2,207 84	1,129 68	.....	529 36	
374 04	.....	.....	.....	.....	.....	194 45	651 23	131 57	
.....	2,883 81	410 00	2,473 81	.....	2,473 81	675 00	.....	155 44	
.....	.....	.....	.....	.....	.....	.....	.....	599 94	
.....	.....	.....	.....	.....	.....	.....	.....	1,453 43	
347 23	2,189 26	620 88	1,568 38	.....	1,568 38	797 71	723 03	771 02	Bruce.
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
.....	400 00	.....	400 00	.....	400 00	400 00	.....	.....	
1 00	1,410 59	3 60	1,406 99	.....	1,406 99	192 64	2 00	1 00	
389 30	.....	.....	.....	.....	.....	90 50	1,158 63	7 97	
.....	3,340 71	529 20	2,811 51	31 15	2,780 36	675 00	.....	132 95	
288 57	.....	.....	.....	.....	.....	.....	.....	616 02	
432 87	.....	.....	.....	.....	.....	.....	.....	2,012 71	
939 08	6,378 33	2,002 38	4,375 95	.....	4,375 95	2,464 12	630 65	3,416 43	Carlton.
.....	1,300 00	.....	1,300 00	.....	1,300 00	.....	.....	1,300 00	
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
.....	2,147 50	520 00	1,627 50	.....	1,627 50	.....	.....	1,510 70	
.....	.....	.....	.....	.....	.....	.....	.....	636 80	
239 98	1,327 82	848 27	479 55	.....	479 55	427 08	.....	42 00	
400 49	.....	.....	.....	.....	.....	117 30	524 89	180 76	
.....	4,860 63	1,627 00	3,233 63	96 73	3,136 90	450 00	.....	239 52	
.....	.....	.....	.....	.....	.....	.....	.....	1,521 50	
.....	.....	.....	.....	.....	.....	.....	.....	2,649 61	
415 83	1,231 10	542 58	688 52	.....	688 52	620 15	327 61	270 68	Dufferin.
.....	425 20	35	424 85	.....	424 85	.....	.....	396 50	
27 00	.....	.....	.....	.....	.....	.....	.....	72 18	
86 95	852 10	75 00	777 10	.....	777 10	383 17	.....	.....	
177 00	.....	.....	.....	.....	.....	71 90	407 15	70 00	
15	1,799 20	94 50	1,704 70	.....	1,704 70	675 00	.....	34 45	
8 10	.....	.....	.....	.....	.....	.....	.....	347 10	
40	.....	.....	.....	.....	.....	.....	.....	750 55	
560 64	2,240 48	838 49	1,401 99	.....	1,401 99	979 64	509 51	603 92	Elgin.
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
.....	258 76	.....	258 76	.....	258 76	.....	.....	383 36	
336 35	2,032 97	437 24	1,595 73	.....	1,595 73	996 95	51 00	110 20	
416 19	.....	.....	.....	.....	.....	808 37	16 00	92 11	
144 30	3,251 67	562 80	2,688 87	18 89	2,669 98	675 00	.....	265 45	
102 29	.....	.....	.....	.....	.....	.....	.....	644 65	
81 55	.....	.....	.....	.....	.....	.....	.....	1,763 33	

APPENDIX F.—Return of fees and emoluments of County Judicial

County and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			$ c.	$ c.	$ c.	$ c.
ESSEX: Sandwich.	Sheriff	J. E. D'Avignon	2,737 21	.....	2,737 21	1,961 48
	Surrogate Judge	Judge McHugh	836 00	.....	836 00	.....
	Local Master	Henry Clay	115 53	.....	115 53	93 73
	Crown Attorney	J. H. Rodd	1,140 35	.....	2,170 31	895 30
	Clerk of the Peace.	"	1,029 96	.....	.....	711 75
	Local Registrar	Francis Cleary	296 67	675 00	3,370 16	971 67
	County Court Clerk	"	652 22	.....	.....	632 22
	SurrogateRegistrar	"	1,746 27	.....	.....	1,746 27
FRONTENAC Kingston.	Sheriff	Thomas Dawson	2,456 03	.....	2,456 03	2,098 77
	Surrogate Judge	Judge Price	Commuted	752 00	.....	.....
	Local Master	J. B. Walkem, KC	106 54	.....	106 54	85 54
	Crown Attorney	J. L. Whiting, K.C.	229 20	.....	1,043 25	156 20
	Clerk of the Peace.	"	814 05	.....	.....	468 25
	Local Registrar	T. M. Asselstine.	77 82	675 00	1,292 97	752 82
	County Court Clerk	"	540 15	.....	.....	540 15
	SurrogateRegistrar	Miss H. Fraser	1,265 44	.....	1,265 44	1,170 12
GREY: Owen Sound	Sheriff	C. H. Moore	2,665 68	.....	2,665 68	2,134 55
	Surrogate Judge	Judge Hatton	984 50	.....	984 50	.....
	Local Master	Judge Widdifield	280 70	.....	280 70	155 40
	Crown Attorney	J. Armstrong	850 50	.....	2,140 96	593 50
	Clerk of the Peace.	"	1,290 46	.....	.....	860 50
	Local Registrar	W. A. Bishop	126 12	750 00	3,687 79	751 12
	County Court Clerk	"	621 15	.....	.....	621 15
	SurrogateRegistrar	"	2,190 52	.....	.....	2,190 52
HALDIMAND Cayuga	Sheriff	M. McConnell	2,175 67	.....	2,175 67	1,479 69
	Surrogate Judge	Judge Douglas	480 15	.....	504 75	480 15
	Local Master	"	24 60	.....	.....	24 60
	Crown Attorney	J. A. Murphy	728 39	.....	2,087 31	503 34
	Clerk of the Peace.	"	1,358 92	.....	.....	1,014 42
	Local Registrar	J. C. Eccles	116 20	600 00	2,003 07	716 20
	County Court Clerk	"	356 67	.....	.....	351 02
	SurrogateRegistrar	"	930 20	.....	.....	914 50
HALTON: Milton	Sheriff	Sam. Webster	1,269 44	.....	1,269 44	771 10
	Surrogate Judge	Judge Gorham	414 90	.....	448 90	414 90
	Local Master	"	34 00	.....	.....	34 00
	Crown Attorney	W. I. Dick	327 50	.....	1,396 35	249 50
	Clerk of the Peace.	"	1,068 85	.....	.....	685 05
	Local Registrar	W. A. Lawrence.	62 20	600 00	1,547 90	662 20
	County Court Clerk	"	123 30	.....	.....	123 30
	SurrogateRegistrar	"	762 40	.....	.....	762 40
HASTINGS: Belleville	Sheriff	M. B. Morrison	2,942 26	.....	2,942 26	1,944 55
	Surrogate Judge	Judge Fraleck	commuted	985 00	.....	.....
	Local Master	S. S. Lazier	commuted.	3,000 00	.....	.....
	Deputy Registrar	"				
	Crown Attorney	P. J. M. Anderson	1,647 92	.....	2,970 07	1,157 75
	Clerk of the Peace.	"	1,322 15	.....	.....	1,215 65
	Deputy Cl'k of the Crown	John Williams	125 45	450 00	3,634 93	575 45
	County Court Cl'k.	"	918 38	.....	.....	918 38
	SurrogateRegistrar	"	2,141 10	.....	.....	2,141 10

Officers throughout the Province of Ontario, etc.—Continued.

Total received for past years' services.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under 10 Edw. VII., cap. 5.	Net Income.	Earnings of each officer payable by the Province, the County, and the General Public, respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
613 33	2,574 81	692 36	1,882 45	.....	1,882 45	1,319 01	599 00	819 20	Essex.
.....	836 00	.....	836 00	.....	836 00	.....	.....	836 00	
70 75	164 48	90 00	74 48	.....	74 48	.....	.....	115 53	
372 00	2,262 93	550 00	1,712 93	.....	1,712 93	812 70	.....	327 65	
283 88	.....	.....	.....	.....	.....	146 40	800 00	83 56	
.....	3,362 76	501 49	2,861 27	36 12	2,825 15	675 00	.....	296 67	
.....	.....	.....	.....	.....	.....	.....	.....	652 22	
12 60	.....	.....	.....	.....	.....	.....	.....	1,746 27	
497 06	2,595 83	609 15	1,986 68	.....	1,986 68	854 08	563 40	1,038 55	Frontenac.
.....	752 00	.....	752 00	.....	752 00	752 00	.....	.....	
43 50	129 04	5 00	124 04	.....	124 04	.....	.....	106 54	
164 00	1,211 00	50 00	1,161 00	.....	1,161 00	229 20	.....	.....	
422 55	.....	.....	.....	.....	.....	101 35	672 70	40 00	
.....	1,292 97	5 00	1,287 97	.....	1,287 97	675 00	.....	77 82	
.....	.....	.....	.....	.....	.....	.....	.....	540 15	
106 00	1,276 12	13 75	1,262 37	.....	1,262 37	.....	.....	1,265 44	
643 88	2,778 43	1,161 64	1,616 79	.....	1,616 79	955 88	738 68	971 12	Grey.
.....	984 50	.....	984 50	.....	984 50	.....	.....	984 50	
33 30	188 70	.....	188 70	.....	188 70	.....	.....	280 70	
137 00	1,929 26	348 92	1,580 34	.....	1,580 34	595 50	220 00	35 00	
338 26	.....	.....	.....	.....	.....	161 00	1,041 80	87 66	
125 00	3,687 79	279 70	3,408 09	131 62	3,276 47	750 00	.....	126 12	
.....	.....	.....	.....	.....	.....	.....	.....	621 15	
.....	.....	.....	.....	.....	.....	.....	.....	2,190 52	
315 41	1,795 10	484 22	1,310 88	.....	1,310 88	1,119 41	634 33	421 93	Haldimand.
.....	526 75	.....	526 75	.....	526 75	.....	.....	480 15	
22 00	.....	.....	.....	.....	.....	.....	.....	24 60	
126 00	1,959 56	427 00	1,523 56	.....	1,532 56	711 08	7 31	10 00	
315 80	.....	.....	.....	.....	.....	176 09	1,151 82	31 01	
.....	1,981 72	200 67	1,781 05	.....	1,781 05	600 00	.....	116 20	
.....	.....	.....	.....	.....	.....	.....	.....	356 67	
.....	.....	.....	.....	.....	.....	.....	.....	930 20	
190 83	961 93	658 70	303 23	.....	303 23	549 75	323 66	396 03	Halton.
.....	448 90	.....	448 90	.....	448 90	.....	.....	414 90	
.....	.....	.....	.....	.....	.....	.....	.....	34 00	
59 75	1,347 99	116 35	1,231 64	.....	1,231 64	324 50	.....	3 00	
353 69	.....	.....	.....	.....	.....	62 40	963 24	43 21	
.....	1,547 90	320 00	1,227 90	.....	1,227 90	600 00	.....	62 20	
.....	.....	.....	.....	.....	.....	.....	.....	123 30	
.....	.....	.....	.....	.....	.....	.....	.....	762 40	
904 94	2,849 49	886 18	1,963 31	.....	1,963 31	1,597 59	856 18	488 41	Hastings.
.....	985 00	.....	985 00	.....	985 00	985 00	.....	.....	
.....	3,000 00	550 00	2,450 00	.....	2,450 00	3,000 00	.....	.....	
409 10	2,881 25	488 85	2,392 40	39 24	2,353 16	1,544 92	.....	103 00	
98 75	.....	.....	.....	.....	.....	265 15	1,050 00	7 00	
.....	3,634 93	540 36	3,094 57	68 91	3,025 66	450 00	.....	125 45	
.....	.....	.....	.....	.....	.....	.....	.....	918 38	
.....	.....	.....	.....	.....	.....	.....	.....	2,141 10	

APPENDIX F.—Return of fees and emoluments of County Judicial

County and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			$ c.	$ c.	$ c	$ c.
HURON: Goderich.	Sheriff	R. G. Reynolds	2,597 14	.....	2,597 14	2,478 97
	Surrogate Judge	Judge Doyle	commuted.	1,000 00	1,215 91	1,000 00
	Local Master	"	215 91	.....	.....	80 31
	Crown Attorney	C. Seager	1,019 75	.....	2,371 98	496 20
	Clerk of the Peace	"	1,352 23	.....	.....	1,264 88
	Local Registrar	D. McDonald	46 00	750 00	3,657 20	796 00
	County Court Clerk.	"	328 35	.....	.....	328 35
	SurrogateRegistrar	"	2,532 85	.....	.....	2,532 85
KENORA: Kenora.	Sheriff	John W. Humble.	1,956 18	1,000 00	2,956 18	2,488 85
	Surrogate Judge	Judge Chapple	.....	*500 00	625 90	500 00
	Local Master	"	125 90	.....	.....	125 90
	Crown Attorney	†J.F.McGillivray, K.C.	387 00	.....	828 29	264 35
	Clerk of the Peace.	"	191 29	250 00	.....	362 21
	Local Registrar	C. W. Chadwick.	56 00	700 00	1,167 97	756 00
	District Court Cl'k.	"	257 98	.....	.....	257 98
	SurrogateRegistrar	"	153 99	.....	.....	153 99
KENT: Chatham.	Sheriff	J. R. Gemmill	2,427 31	.....	2,427 31	1,572 92
	Surrogate Judge	Judge Bell	675 50	.....	675 50	.....
	Local Master	‡Thos. Scullard.	114 32	.....	114 32	73 82
	Crown Attorney	H. D. Smith	1,607 91	.....	2,804 51	1,359 43
	Clerk of the Peace.	"	1,196 60	.....	.....	1,111 90
	Local Registrar	James Holmes	248 00	675 00	2,766 00	923 00
	County Court Clerk.	"	585 00	.....	.....	585 00
	Surrogate Regist'r.	"	1,258 00	.....	.....	1,258 00
LAMBTON: Sarnia.	Sheriff	James Flintoft	2,087 27	.....	2,087 27	1,489 09
	Surrogate Judge	Judge Macwatt	commuted.	1,000 00	1,056 20	1,000 00
	Local Master	"	56 20	.....	.....	53 30
	Crown Attorney	J. P. Bucke	542 76	.....	1,707 16	402 10
	Clerk of the Peace.	"	1,164 40	.....	.....	1,099 40
	Local Registrar	Alex Saunders	123 81	675 00	2,955 10	686 31
	County Court Clerk.	"	593 89	.....	.....	593 89
	Surrogate Regist'r.	"	1,562 40	.....	.....	1,562 40
LANARK: Perth.	Sheriff	§D. G. MacMartin	1,363 10	.....	1,363 10	1,052 84
	Surrogate Judge	Judge Senkler	827 25	.....	912 61	827 25
	Local Master	"	85 36	.....	.....	19 98
	Crown Attorney	E.G.Malloch,K.C.	507 92	.....	1,137 42	305 17
	Clerk of the Peace	"	629 50	.....	.....	343 28
	Local Registrar	W. P. McEwen	124 90	675 00	2,431 50	773 90
	County Court Clerk.	"	378 60	.....	.....	275 30
	Surrogate Regist'r.	"	1,253 00	.....	.....	840 00
LEEDS & GRENVILLE: Brockville.	Sheriff	G. A. Dana	2,549 53	.....	2,549 53	1,973 39
	Surrogate Judge	Judge McDonald,	Commuted.	960 00	1,182 98	960 00
	Local Masters	"	222 98	.....	.....	86 35
		Judge Reynolds.	78 46	.....	78 46	90
	Crown Attorney	M. M. Brown	926 84	.....	2,182 92	701 10
	Clerk of the Peace.	"	1,256 08	.....	.....	861 29
	Local Registrar	O. K. Fraser	313 90	750 00	3,790 10	1,062 70
	County Court Clerk.	"	766 90	.....	.....	648 35
	Surrogate Regist'r.	"	1,959 30	.....	.....	1,848 85

†Appointed 2nd May, 1910. *By 10 Edw. VII., Cap. 26, sec. 13.
‡Appointed 11th March, 1910.
§Appointed 8th April, 1910.

Officers throughout the Province of Ontario, etc.—Continued.

Total received for past years' services.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under 10 Edw. VII., cap. 5.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
77 83	2,556 80	602 22	1,954 58	.....	1,954 58	1,062 84	647 50	886 80	Huron.
.....	1,273 13	1 93	1,271 20	.....	1,271 20	1,000 00	.....	.....	
192 82	.....	.....	.....	.....	.....	.....	.....	215 91	
237 20	2,120 80	301 90	1,818 90	.....	1,818 90	1,019 75	.....	.....	
122 52	.....	.....	.....	.....	.....	164 15	1,100 00	88 08	
.....	3,657 20	750 80	2,906 40	40 64	2,865 76	750 00	.....	46 00	
.....	.....	.....	.....	.....	.....	.....	.....	328 35	
.....	.....	.....	.....	.....	.....	.....	.....	2,532 85	
866 54	3,355 39	1,043 87	2,311 52	.....	2,311 52	2,026 52	.....	929 66	Kenora.
*	625 90	25 00	600 90	.....	600 90	500 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	125 90	
383 65	1,048 51	9 40	1,039 11	.....	1,039 11	387 00	.....	.....	
38 30	.....	.....	.....	.....	.....	421 29	.....	20 13	
.....	1,167 97	206 00	961 97	.....	961 97	700 00	.....	56 00	
.....	.....	.....	.....	.....	.....	.....	.....	257 98	
.....	.....	.....	.....	.....	.....	.....	.....	153 99	
591 18	2,164 10	670 09	1,494 01	.....	1,494 01	985 81	665 91	775 59	Kent.
.....	675 50	.....	675 50	.....	675 50	.....	.....	675 50	
.....	73 82	.....	73 82	.....	73 82	.....	.....	114 32	
353 80	2,909 83	650 00	2,259 83	25 98	2,233 85	808 71	.....	799 20	
84 70	.....	.....	.....	.....	.....	196 60	1,000 00	.....	
.....	2,766 00	674 00	2,092 00	.....	2,092 00	675 00	.....	248 00	
.....	.....	.....	.....	.....	.....	.....	.....	585 00	
.....	.....	.....	.....	.....	.....	.....	.....	1,258 00	
577 68	2,066 77	620 87	1,445 90	.....	1,445 90	890 14	533 55	663 58	Lambton.
.....	1,065 25	3 15	1,062 10	.....	1,062 10	1,000 00	.....	.....	
11 95	.....	.....	.....	.....	.....	.....	.....	56 20	
128 51	1,680 96	180 17	1,500 79	.....	1,500 79	407 10	45 66	.....	
50 95	.....	.....	.....	.....	.....	144 40	1,020 00	.....	
112 50	2,955 10	720 00	2,235 10	.....	2,235 10	675 00	.....	123 81	
.....	.....	.....	.....	.....	.....	.....	.....	593 89	
.....	.....	.....	.....	.....	.....	.....	.....	1,562 40	
327 37	1,380 21	677 41	702 80	.....	702 80	665 14	411 17	286 79	Lanark
.....	940 71	.....	940 71	.....	940 71	.....	.....	827 25	
93 48	.....	.....	.....	.....	.....	.....	.....	85 36	
137 60	1,028 95	130 52	898 43	.....	898 43	290 65	206 77	10 50	
242 90	.....	.....	.....	.....	.....	139 55	443 82	46 13	
62 80	2,428 50	270 30	2,158 20	.....	2,158 20	675 00	.....	124 90	
82 00	.....	.....	.....	.....	.....	.....	.....	378 60	
394 50	.....	.....	.....	.....	.....	.....	.....	1,253 00	
342 24	2,315 63	739 50	1,576 13	.....	1,576 13	1,288 18	647 90	613 45	Leeds and Grenville.
.....	1,293 00	.....	1,293 00	.....	1,293 00	960 00	.....	.....	
246 65	.....	.....	.....	.....	.....	.....	.....	222 98	
3 60	4 50	.....	4 50	.....	4 50	.....	.....	78 46	
71 00	1,945 29	275 55	1,669 74	.....	1,669 74	859 84	.....	67 00	
311 90	.....	.....	.....	.....	.....	250 60	925 84	79 64	
2 00	3,833 15	396 50	3,436 65	137 33	3,299 32	750 00	.....	313 90	
72 45	.....	.....	.....	.....	.....	.....	.....	766 90	
198 80	.....	.....	.....	.....	.....	.....	.....	1,959 30	

APPENDIX F.—Return of fees and emoluments of County Judicial

County and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices	Total received for present year's services.
			$ c.	$ c.	$ c.	$ c.
LENNOX & ADDINGTON: Napanee.	Sheriff	G. D. Hawley	1,330 62	.....	1,330 62	1,052 68
	Surrogate Judge	Judge Madden	561 90	.....	561 90	561 90
	Local Master	S. S. Lazier	37 18	.....	37 18	27 40
	Crown Attorney	H.M.Deroche,K.C.	93 60	.....	912 67	55 60
	Clerk of the Peace.	"	819 07	.....	.....	529 21
	Local Registrar	W. P. Deroche	39 90	600 00	1,600 87	639 90
	County Court Clerk.	"	240 25	.....	.....	240 25
	Surrogate Regist'r.	"	720 72	.....	.....	720 72
LINCOLN: St. Catharines.	Sheriff	T. C. Dawson	2,414 81	.....	2,414 81	1,310 76
	Surrogate Judge	Judge Carmen	986 10	.....	1,080 10	986 00
	Local Master	...	94 00	.....	.....	78 00
	Crown Attorney	M. Brennan	537 60	.....	1,956 65	390 20
	Clerk of the Peace.	"	1,419 05	.....	.....	877 15
	Local Registrar	Johnson Clench	234 13	675 00	2,642 70	887 93
	County Court Clerk	" ...	450 11	.....	.....	425 81
MANITOULIN: Gore Bay.	Surrogate Regist'r.	" ...	1,283 46	.....	.....	1,249 14
	Sheriff	J. Haddow Fell	1,018 24	750 00	1,768 24	1,339 96
	Surrogate Judge	Judge Hewson	.....	*500 00	517 00	500 00
	Local Master	" ...	17 00	.....	.....	17 00
	Crown Attorney	A. G. Murray	320 00	250 00	1,054 45	433 00
	Clerk of the Peace.	" ..	484 45	.....	.....	295 31
	Local Registrar	C. C. Platt	4 00	.....	.....	4 00
	District Court Cl'k.	"	137 59	700 00	938 61	837 59
	Surrogate Regist'r.	"	97 02	.....	.....	97 02
MIDDLESEX: London.	Sheriff	D. M. Cameron	4,092 95	.....	4,092 95	3,137 82
	Surrogate Judges.	Judge Macbeth	1,300 00	.....	1,300 00	.....
		Judge Elliott	777 50	.....	777 50	.....
	Local Master	R. K. Cowan	730 22	.....	1,990 84	652 62
	Deputy Registrar.	"	1,260 62	.....	.....	962 21
	Crown Attorney	J. B. McKillop	1,876 41	.....	3,669 73	1,265 56
	Clerk of the Peace.	" ..	1,793 32	.....	.....	1,065 86
	Deputy Clerk of the Crown	Edmund Weld	106 50	500 00	5,551 59	606 50
	County Court Clerk.	" ...	941 67	.....	.....	783 86
	SurrogateRegistrar	" ...	4,003 42	.....	.....	3,790 57
MUSKOKA: Bracebridge.	Sheriff	D. E. Bastedo	1,564 06	750 00	2,314 06	1,928 51
	Surrogate Judge	Judge Mahaffy	.....	*500 00	.....	.....
	Local Master	" ..	.....	.....	.....	.....
	Crown Attorney	Thomas Johnson	336 33	250 00	1,111 98	490 33
	Clerk of the Peace.	"	525 65	.....	.....	255 12
	Local Registrar	Isaac Huber	112 25	600 00	1,294 32	712 25
	District Court Cl'k.	"	222 07	.....	.....	222 07
	SurrogateRegistrar	"	360 00	.....	.....	360 00
NIPISSING: Gore Bay	Sheriff	H. C. Varin	7,998 86	1,000 00	8,998 86	8,603 68
	Surrogate Judge	Judge Valin	.....	*500 00	523 70	500 00
	Local Master	"	23 70	.....	.....	23 70
	Crown Attorney	A G. Browning, K.C.	499 39	250 00	1,294 09	582 39
	Clerk of the Peace.	"	544 70	.....	.....	294 96
	Local Registrar	T. J. Bourke	586 00	150 00	3,408 30	599 80
	District Court Cl'k	"	1,622 30	450 00	.....	2,013 50
	SurrogateRegistrar	"	600 00	.....	.....	581 80

*By 10 Edw. VII., Cap. 26, Sec. 13.

Officers throughout the Province of Ontario, etc.—Continued.

Total received for past years' services.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under 10 Edw. VII., cap. 5.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
276 65	1,329 33	271 99	1,057 34	.....	1,057 34	520 84	544 16	265 62	Lennox and
.....	561 90	.....	561 90	.....	561 90	.....	.....	561 90	Addington.
44 36	71 76	7 00	64 76	.....	64 76	.....	.....	37 18	
34 00	917 04	28 00	889 04	.....	889 04	93 60	.....	.....	
298 23	.....	.....	.....	.....	.....	63 30	755 77	.....	
.....	1,600 87	111 35	1,489 52	.....	1,489 52	600 00	.....	39 90	
.....	.....	.....	.....	.....	.....	.....	.....	240 25	
.....	.....	.....	.....	.....	.....	.....	.....	720 72	
									Lincoln.
465 09	1,775 85	232 65	1,543 20	.....	1,543 20	738 99	604 20	1,071 62	
.....	1,074 10	.....	1,074 10	.....	1,074 10	.....	.....	986 10	
10 00	.....	.....	.....	.....	.....	.....	.....	94 00	
100 20	1,835 45	150 00	1,685 45	.....	1,685 45	537 60	.....	.....	
467 90	.....	.....	.....	.....	.....	147 95	1,116 10	155 00	
8 00	2,570 88	546 51	2,024 37	.....	2,024 37	675 00	.....	234 13	
.....	.....	.....	.....	.....	.....	.....	.....	450 11	
.....	.....	.....	.....	.....	.....	.....	.....	1,283 46	
									Manitoulin.
343 21	1,683 17	250 20	1,432 97	.....	1,432 97	1,408 89	.....	359 35	
.....	531 20	.....	531 20	.....	531 20	500 00	.....	.....	
14 20	.....	.....	.....	.....	.....	.....	.....	17 00	
99 95	1,008 80	150 00	858 80	.....	858 80	389 00	.....	181 00	
180 64	.....	.....	.....	.....	.....	325 32	.....	159 13	
.....	938 61	.....	938 61	.....	938 61	.....	.....	4 00	
.....	.....	.....	.....	.....	.....	700 00	.....	137 59	
.....	.....	.....	.....	.....	.....	.....	.....	97 02	
									Middlesex.
894 42	4,032 24	1,698 02	2,334 22	.....	2,334 22	1,182 84	1,815 02	1,095 09	
.....	1,300 00	.....	1,300 00	.....	1,300 00	.....	.....	1,300 00	
.....	777 50	.....	777 50	.....	777 50	.....	.....	777 50	
173 00	1,914 15	427 00	1,487 15	.....	1,487 15	.....	.....	730 22	
126 32	.....	.....	.....	.....	.....	.....	.....	1,260 62	
399 64	3,317 95	933 00	2,384 95	38 49	2,346 46	1,744 55	52 66	79 20	
586 89	.....	.....	.....	.....	.....	308 15	1,375 58	109 59	
55 00	5,409 80	1,930 00	3,479 80	145 96	3,333 84	500 00	.....	106 50	
.....	.....	.....	.....	.....	.....	.....	.....	941 67	
173 87	.....	.....	.....	.....	.....	.....	.....	4,003 42	
									Muskoka.
445 73	2,374 24	1,005 00	1,369 24	.....	1,369 24	2,087 03	.....	227 03	
.....	500 00	.....	500 00	.....	500 00	500 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	
163 25	1,181 69	27 55	1,154 14	.....	1,154 14	586 33	.....	.....	
272 99	.....	.....	.....	.....	.....	492 97	.....	32 68	
.....	1,294 32	30 60	1,263 72	.....	1,263 72	600 00	.....	112 25	
.....	.....	.....	.....	.....	.....	.....	.....	222 07	
.....	.....	.....	.....	.....	.....	.....	.....	360 00	
156 07	8,759 75	4,395 61	4,364 14	.....	4,364 14	3,718 76	.....	5,280 10	Nipissing
.....	557 30	.....	557 30	.....	557 30	500 00	.....	.....	
33 60	.....	.....	.....	.....	.....	.....	.....	23 70	
266 91	1,258 70	115 00	1,143 70	.....	1,143 70	749 39	.....	.....	
114 44	.....	.....	.....	.....	.....	544 70	.....	.....	
165 80	3,611 50	594 41	3,017 09	53 41	2,963 68	150 00	.....	586 00	
162 70	.....	.....	.....	.....	.....	450 00	.....	1,622 30	
87 90	.....	.....	.....	.....	.....	.....	.....	600 00	

APPENDIX F.—Return of fees and emoluments of County Judicial

County and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			$ c.	$ c.	$ c.	$ c.
NORFOLK:						
Simcoe ...	Sheriff	F. S. Snider	1,458 83	.....	1,458 83	1,129 78
	Surrogate Judge ..	Judge Robb	464 00	.....	498 30	464 00
	Local Master.....	"	34 30	.....	.....	.....
	Crown Attorney...	T. R. Slaght, K.C.	879 55	.....	2,507 42	644 25
	Clerk of the Peace.	"	1,627 87	.....	.....	1,036 20
NORTHUMBERLAND AND DURHAM:	Local Registrar ..	C. C. Rapelje....	310 40	675 00	2,500 87	791 25
	County Court Cl'k.	"	407 10	.....	.....	318 10
	SurrogateRegistrar	"	1,108 37	.....	.....	760 05
Cobourg ..	Sheriff	I. O. Proctor	2,688 04	.....	2,688 04	1,850 79
	Surrogate Judge...	Judge Benson ...	Commuted	1,000 00	.....	.....
	Local Master	Judge Roger	36 80	.....	36 80	22 90
	Crown Attorney...	W. F. Kerr.....	993 15	.....	2,091 24	659 56
	Clerk of the Peace.	"	1,098 09	.....	.....	678 66
	Local Registrar...	John T. Field ...	147 75	750 00	3,518 15	897 75
	County Court Clerk	"	432 90	.....	.....	432 90
	SurrogateRegistrar	"	2,187 50	.....	.....	2,187 50
ONTARIO:						
Whitby ..	Sheriff	J. F. Paxton	2,491 17	.....	2,491 17	1,952 42
	Surrogate Judge...	G. Y. Smith.....	900 70	.....	1,070 30	900 70
	Local Master	"	169 60	.....	.....	119 60
	Crown Attorney...	J.E.Farewell, KC	891 18	.....	2,347 63	730 96
	Clerk of the Peace.	"	1,456 45	.....	.....	962 41
	Local Registrar...	‡Theo. A. McGil-	91 34	675 00	2,658 15	766 34
	County Court Cl'k.	" livray	244 92	.....	.....	244 92
	SurrogateRegistrar	"	1,646 89	.....	.....	1,646 89
OXFORD:						
Woodstock	Sheriff	James Brady....	2,002 49	.....	2,002 49	1,811 56
	Surrogate Judge ..	Judge Finkle....	Commuted	1,000 00	.....	.....
	Local Master	W. T. McMullen.	628 10	.....	748 60	505 75
	Deputy Registrar..	"	120 50	.....	.....	100 60
	Crown Attorney...	R. N. Ball	380 00	.....	380 00	326 90
	Clerk of the Peace.	F. R. Ball, K.C..	759 98	.....	759 98	462 32
	Deputy Clerk of the Crown.....	James Canfield..	183 90	450 00	3,669 70	521 40
	County Court Clerk	"	666 75	.....	.....	452 00
PARRY SOUND:	SurrogateRegistrar	"	2,369 05	.....	.....	1,855 00
Parry Sound	Sheriff	Sam'l Armstrong	2,012 21	750 00	2,762 21	2,104 81
	Surrogate Judge ..	Judge McCurry..	.....	*500 00	523 50	500 00
	Local Master.....	"	23 50	.....	.....	23 50
	Crown Attorney...	W. L. Haight....	754 14	250 00	1,439 75	755 06
	Clerk of the Peace.	"	435 61	.....	.....	206 59
	Local Registrar...	E. Jordan.....	58 00	600 00	1,058 35	658 00
	District Court Cl'k.	"	198 00	.....	.....	198 00
	SurrogateRegistrar	"	202 35	.....	.....	202 35
PEEL:						
Brampton.	Sheriff	†Robert Broddy.	1,529 01	.....	1,529 01	1,154 64
	Surrogate Judge...	Judge McGibbon.	590 95	.....	608 15	590 95
	Local Master	"	17 20	.....	.....	17 20
	Crown Attorney...	W. H. McFadden, K.C.	681 90	.....	1,527 70	485 95
	Clerk of the Peace.	"	845 80	.....	.....	711 16
	Local Registrar...	J. B. Dixon.....	169 05	600 00	2,233 91	619 05
	County Court Cl'k.	"	181 85	.....	.....	181 85
	SurrogateRegistrar	"	1,283 01	.....	.....	1,283 01

†Nathan Henderson appointed from 1st January, 1911, *By 10 Edward VII hap. 26, sec. 13.
‡Appointed 14th March, 1911.

Officers throughout the Province of Ontario, etc.—Continued.

Total received for past years' services.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts,	Amount paid to Province under 10 Edw., VII., cap. 5.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
436 17	1,565 95	633 05	932 90	.....	932 90	608 40	471 48	378 85	Norfolk.
.....	479 52	.....	479 52	.....	479 52	.....	.....	464 00	
15 52	.....	.....	.....	.....	.....	.....	.....	34 30	
198 00	2,546 05	648 95	1,897 10	.....	1,897 10	208 80	663 75	7 00	
667 60	.....	.....	.....	.....	.....	81 70	1,501 66	44 51	
23 60	2,209 35	92 65	2,116 70	.....	2,116 70	675 00	.....	310 40	
133 10	.....	.....	.....	.....	.....	.....	.....	407 10	
183 25	.....	.....	.....	.....	.....	.....	.....	1,108 37	
825 40	2,676 19	681 00	1,995 19	.....	1,995 19	1,266 82	904 70	516 52	Northumberland and Durham.
.....	1,000 00	.....	1 000 00	.....	1,000 00	1,000 00	.....	.....	
.....	22 90	.....	22 90	.....	22 90	.....	.....	36 80	
448 19	2,238 45	362 46	1,875 99	.....	1,875 99	847 28	22 00	123 87	
452 04	.....	.....	.....	.....	.....	181 60	801 29	115 20	
.....	3,518 15	550 20	2,967 95	46 79	2,921 16	750 00	.....	147 75	
.....	.....	.....	.....	.....	.....	.....	.....	432 90	
.....	.....	.....	.....	.....	.....	.....	.....	2,187 50	
497 17	2,449 59	784 85	1,664 74	.....	1,664 74	820 37	509 68	1,161 12	Ontario.
.....	1,120 30	.....	1,120 30	.....	1,120 30	.....	.....	900 70	
100 00	.....	.....	.....	.....	.....	.....	.....	169 60	
206 98	2,445 12	476 59	1,968 53	.....	1,968 53	781 80	.....	109 38	
544 77	.....	.....	.....	.....	.....	185 75	1,261 65	9 05	
.....	2,658 15	640 00	2,018 15	.....	2,018 15	675 00	.....	91 34	
.....	.....	.....	.....	.....	.....	.....	.....	244 92	
.....	.....	.....	.....	.....	.....	.....	.....	1,646 89	
92 40	1,903 96	1,023 93	880 03	.....	880 03	905 82	602 30	494 37	Oxford.
.....	1,000 00	.....	1,000 00	.....	1,000 00	1,000 00	.....	.....	
170 60	805 55	100 00	705 55	.....	705 55	.....	.....	628 10	
28 60	.....	.....	.....	.....	.....	.....	.....	120 50	
13 00	339 90	8 00	331 90	.....	331 90	147 00	.....	233 00	
350 66	812 98	21 00	791 98	.....	791 98	95 00	648 23	16 75	
162 50	3,580 90	224 30	3,356 60	121 32	3,235 28	450 00	.....	183 90	
120 00	.....	.....	.....	.....	.....	.....	.....	666 75	
470 00	.....	.....	.....	.....	.....	.....	.....	2,369 05	
552 00	2,656 81	1,478 85	1,177 96	.....	1,177 96	2,281 11	.....	481 10	Parry Sound.
.....	523 50	.....	523 50	.....	523 50	500 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	23 50	
159 50	1,316 91	201 13	1,115 78	.....	1,115 78	897 64	.....	106 50	
195 76	.....	.....	.....	.....	.....	421 41	.....	14 20	
.....	1,058 35	68 10	990 25	.....	990 25	600 00	.....	58 00	
.....	.....	.....	.....	.....	.....	.....	.....	198 00	
.....	.....	.....	.....	.....	.....	.....	.....	202 35	
354 40	1,509 04	686 07	822 97	.....	822 97	786 68	440 20	302 13	Peel.
.....	608 15	.....	608 15	.....	608 15	.....	.....	590 95	
.....	.....	.....	.....	.....	.....	.....	.....	17 20	
150 60	1,489 01	261 51	1,227 50	.....	1,227 50	663 90	.....	18 00	
141 30	.....	.....	.....	.....	.....	159 30	616 19	70 31	
170 00	2,253 91	177 02	2,076 89	.....	2,076 89	600 00	.....	169 05	
.....	.....	.....	.....	.....	.....	.....	.....	181 85	
.....	.....	.....	.....	.....	.....	.....	.....	1,283 01	

APPENDIX F.—Return of fees and emoluments of County Judicial

County and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present year's services.
			$ c.	$ c.	$ c.	$ c.
PERTH:						
Stratford.	Sheriff	Thomas Magwood	2,285 45	.....	2,285 45	1,838 20
	Surrogate Judge...	Judge Barron ...	Commuted	873 00	1,723 00	.....
	Local Master	"	Commuted	850 00	.....	.....
	Crown Attorney...	G. G. McPherson K.C.	457 63	.....	1,921 08	357 63
	Clerk of the Peace.	"	1,463 45	.....	.....	979 45
	Local Registrar...	*W. C. Moscrip.	506 60	675 00	3,581 50	1,181 60
	County Court Clerk	"	425 10	.....	.....	425 10
	Surrogate Registrar	"	1,974 80	.....	.....	1,974 80
PETERBOROUGH:						
Peterboro'	Sheriff	James A. Hall...	1,750 18	.....	1,750 18	1,317 76
	Surrogate Judge ..	Judge Huycke ..	772 75	.....	1,111 95	772 75
	Local Master	"	339 20	.....	.....	270 00
	Crown Attorney...	R. E. Wood	712 60	.....	1,776 41	425 30
	Clerk of the Peace.	"	1,063 81	.....	.....	488 26
	Local Registrar...	G. J. Sherry.....	724 90	675 00	3,342 72	1,233 10
	County Court Clerk	"	566 32	.....	.....	565 87
	Surrogate Registrar	"	1,376 50	.....	.....	1,373 58
PRESCOTT & RUSSELL:						
L'Orignal	Sheriff	Albert Hagar . .	1,296 96	.....	1,296 96	803 85
	Surrogate Judge ..	Judge Constantineau.	346 50	.....	433 00	346 50
	Local Master	"	86 50	.....	.....	.....
	Crown Attorney..	John Maxwell...	281 90	.....	1,120 57	238 90
	Clerk of the Peace.	"	838 67	.....	.....	619 17
	Local Registrar...	Joseph Bélanger.	65 60	675 00	1,805 87	719 10
	County Court Clerk	"	208 93	.....	.....	189 78
	Surrogate Registrar	"	856 34	.....	.....	790 69
PRINCE EDWARD:						
Picton....	Sheriff	James Gibson ...	1,205 66	.....	1,205 66	1,038 45
	Surrogate Judge ..	Judge Morrison..	497 05	.....	595 16	497 05
	Local Master	"	98 11	.....	.....	98 11
	Crown Attorney...	J. Roland Brown	123 00	.....	726 01	109 00
	Clerk of the Peace.	"	603 01	.....	.....	411 20
	Local Registrar...	Nehemiah Gilbert	378 10	600 00	2,221 66	978 10
	County Court Clerk	"	309 30	.....	.....	309 30
	Surrogate Registrar	"	934 26	.....	.....	934 26
RAINY RIVER:						
Fort Frances ..	Sheriff	W. A. Baker	1,715 71	750 00	2,465 71	2,401 52
	Surrogate Judge...	Judge Fitch.....	.....	†500 00	553 50	500 00
	Local Master... ..	"	53 50	.....	.....	53 50
	Crown Attorney...	A. D. George, .	665 00	250 00	1,279 30	795 00
	Clerk of the Peace.	A. D. George, .	364 30	.....	.....	201 00
	Local Registrar...	Wm. H. Elliott..	.....	450 00	630 67	450 00
	District Court Cl'k.	"	66 55	.....	.....	66 55
	Surrogate Regist'r	"	114 12	.....	.....	114 12
RENFREW:						
Pembroke.	Sheriff	Alex. Morris....	2,041 62	.....	2,041 62	1,868 31
	Surrogate Judge...	Judge Donahue..	481 00	.....	506 90	481 00
	Local Master.....	"	25 90	.....	.....	.....
	Crown Attorney...	J. A. Metcalf....	128 19	.....	653 29	122 19
	Clerk of the Peace.	"	525 10	.....	....	301 94
	Local Registrar ...	H. W. Perrett...	58 55	600 00	1,892 57	658 55
	County Court Clerk	"	431 62	....	.....	431 62
	Surrogate Registrar	"	802 40	.....	.....	802 40

*E. Sydney Smith, K.C., appointed 19th January, 1911. †By 10 Edw. VII. Cap. 26, Sec. 13.

Officers throughout the Province of Ontario, etc.—Continued.

Total received for past years' services.	Total receipts by officer from all offices.	Total disbursements.	Net receipts.	Amount paid to Province under 10 Edw. VII., cap. 5.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
733 97	2,572 17	633 61	1,938 56	.....	1,938 56	824 52	514 70	946 23	Perth.
.....	1,723 00	.....	1,723 00	.....	1,723 00	873 00	.....	.....	
.....	.....	.....	.....	.....	.....	850 00	.....	.....	
109 50	1,833 96	393 00	1,440 96	.....	1,440 96	261 63	.....	196 00	
387 38	.....	.....	.....	.....	.....	91 25	1,288 63	83 57	
.....	3,581 50	1,012 00	2,569 50	6 95	2,562 55	675 00	.....	506 60	
.....	.....	.....	.....	.....	.....	.....	.....	425 10	
.....	.....	.....	.....	.....	.....	.....	.....	1,974 80	
522 00	1,839 76	821 05	1,018 71	.....	1,018 71	807 55	415 41	527 22	Peterborough
.....	1,042 75	.....	1,042 75	.....	1,042 75	.....	.....	772 75	
.....	.....	.....	.....	.....	.....	.....	.....	339 20	
258 80	1,688 08	107 99	1,580 09	.....	1,580 09	672 60	40 00	.....	
515 72	.....	.....	.....	.....	.....	156 95	811 26	95 60	
132 50	3,305 05	517 75	2,787 30	28 73	2,758 57	675 00	.....	724 90	
.....	.....	.....	.....	.....	.....	.....	.....	566 32	
.....	.....	.....	.....	.....	.....	.....	.....	1,376 50	
444 30	1,248 15	769 48	478 67	.....	478 67	514 29	395 80	386 87	Prescott and Russell.
.....	366 30	.....	366 30	.....	366 30	.....	.....	346 50	
19 80	.....	.....	.....	.....	.....	.....	.....	86 50	
63 85	1,058 92	40 75	1,018 17	.....	1,018 17	120 73	86 97	74 20	
137 00	.....	.....	.....	.....	.....	119 55	671 57	47 55	
2 95	1,741 92	304 20	1,437 72	.....	1,437 72	675 00	.....	65 60	
15 75	.....	.....	.....	.....	.....	.....	.....	208 93	
23 65	.....	.....	.....	.....	.....	.....	.....	856 34	
147 20	1,185 65	756 85	428 80	.....	428 80	494 00	504 12	207 54	Prince Edward.
.....	597 26	5 00	592 26	.....	592 26	.....	.....	497 05	
2 10	.....	.....	.....	.....	.....	.....	.....	98 11	
21 40	754 41	96 00	658 41	.....	658 41	118 00	5 00	.....	
212 81	.....	.....	.....	.....	.....	54 00	524 54	24 47	
.....	2,221 66	178 50	2,043 16	.....	2,043 16	600 00	.....	378 10	
.....	.....	.....	.....	.....	.....	.....	.....	309 30	
.....	.....	.....	.....	.....	.....	.....	.....	934 26	
465 79	2,867 31	487 29	2,380 02	.....	2,380 02	2,184 02	.....	281 69	Rainy River
.....	553 50	.....	553 50	.....	553 50	500 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	53 50	
329 12	1,434 57	26 25	1,408 32	.....	1,408 32	915 00	.....	.....	
109 45	.....	.....	.....	.....	.....	364 30	.....	.....	
.....	630 67	.....	630 67	.....	630 67	450 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	66 55	
.....	.....	.....	.....	.....	.....	.....	.....	114 12	
205 12	2,073 43	617 22	1,456 21	.....	1,456 21	553 50	788 10	700 02	Renfrew.
.....	544 80	.....	544 80	.....	544 80	.....	.....	481 00	
63 80	.....	.....	.....	.....	.....	.....	.....	25 90	
6 00	726 84	25 42	701 42	.....	701 42	108 19	.....	20 00	
296 71	.....	.....	.....	.....	.....	78 30	389 31	57 49	
.....	1,892 57	104 00	1,788 57	.....	1,788 57	600 00	.....	58 55	
.....	.....	.....	.....	.....	.....	.....	.....	431 62	
.....	.....	.....	.....	.....	.....	.....	.....	802 40	

APPENDIX F.—Return of fees and emoluments of County Judicial

County and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present years' services.
			$ c.	$ c.	$ c.	$ c.
SIMCOE:						
Barrie....	Sheriff	Wm.McL. Harvey	2,734 94	.....	2,734 94	2,588 20
	Surrogate Judge...	Judge Ardagh...	Commuted	585 00	.....	.....
	Local Master.....	J. R. Cotter.....	93 40	.....	2,611 57	93 40
	Crown Attorney...	"	819 88	.....	.....	725 13
STORMONT,	Clerk of the Peace.	"	1,698 29	.....	.....	1,280 [illegible]8
DUNDAS	Local Registrar...	John McCosh....	503 20	750 00	2,214 80	1,253 20
AND	County Court Clerk	"	961 60	.....	.....	961 60
GLEN-	Surrogate Regist'r.	E. A. Little.....	2,176 86	.....	2,176 86	2,176 86
GARRY:						
Cornwall .	Sheriff	W. R. Mack.....	2,456 52	.....	2,456 52	1,772 15
	Surrogate Judge...	Judge O'Reilly..	1,000 00	.....	1,609 90	1,000 00
	Local Master.....	"	609 90	.....	.....	439 20
	Crown Attorney...	James Dingwall.	165 64	.....	995 26	117 94
	Clerk of the Peace.	"	829 62	.....	.....	588 45
	Local Registrar...	J. A. McDougald	92 64	750 00	3,435 10	717 64
	County Court Clerk	"	653 65	.....	.....	653 65
	Surrogate Regist'r.	"	1,938 81	.....	.....	1,938 81
SUDBURY:						
Sudbury..	Sheriff	Alex. Irving	2,693 21	950 00	3,643 21	2,982 97
	Surrogate Judge...	Judge Kehoe	.....	*500 00	500 00	500 00
	Local Master	" "	.....	.....	.....	.....
	Crown Attorney...	J. H. Clary.....	941 01	250 00	1,559 63	921 06
	Clerk of the Peace.	"	368 62	.....	.....	228 66
	Local Registrar...	John D. Shipley .	112 70	150 00	1,409 48	262 70
THUNDER	Dist. Court Clerk..	"	446 70	450 00	.....	896 70
BAY:	Surrogate Regist'r.	"	250 08	.....	.....	250 08
Port Ar-						
thur.. ...	Sheriff	A. W. Thompson.	5,438 93	1,000 00	6,438 93	4,945 92
	Surrogate Judge...	Judge O'Leary ..	....	*500 00	832 50	500 00
	Local Master.....	"	332 50	.....	.....	252 00
	Crown Attorney...	W.F. Langworthy	1,450 58	250 00	2,106 68	1,087 63
	Clerk of the Peace.	" [K.C.	406 10	.....	.....	172 00
	Local Registrar...	James Meek	577 98	150 00	2,670 17	646 10
	Dist. Court Clerk..	"	1,045 40	450 00	.....	1,289 20
	Surrogate Regist'r.	"	446 79	.....	.....	420 02
VICTORIA:						
Lindsay ..	Sheriff	John McLennan .	1,392 96	.....	1,392 96	1,087 65
	Surrogate Judge...	Judge McMillan.	492 20	.....	492 20	492 20
	Local Masters...	"	.....	.....	.....	.....
		Judge Harding ..	153 99	.....	153 99	153 99
	Crown Attorney ...	A. P. Devlin	170 00	.....	873 93	89 00
	Clerk of the Peace.	"	703 93	.....	.....	517 68
	Local Registrar ...	J. H. Sootheran..	62 20	675 00	2,163 42	737 20
	County Court Clerk	"	425 55	.....	.....	425 55
	Surrogate Regist'r.	"	1,000 67	.....	.....	1,000 67
WATERLOO:						
Berlin....	Sheriff	John Motz	2,067 94	.....	2,067 94	1,630 12
	Surrogate Judge...	Judge Chisholm .	1,000 00	.....	.....	1,000 00
	Local Master.....	J. J. A. Weir	243 80	.....	243 80	112 97
	Crown Attorney ...	W.H.Bowlby,K.C.	443 05	.....	1,789 28	281 75
	Clerk of the Peace.	"	1,346 23	.....	.....	1,165 48
	Local Registrar ...	E. J. Beaumont..	648 47	675 00	1,850 43	1,279 09
	County Court Clerk	"	526 96	.....	.....	526 96
	Surrogate Regist'r.	James M. Scully.	2,057 65	.....	2,057 65	2,022 70

* By 10 Edw. VII. Cap. 26, sec, 13.

Officers throughout the Province of Ontario, etc.—Continued.

Total received for last years' services.	Total receipts by officers from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under 10 Edw. VII., cap. 5.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
634 54	3,222 74	1,398 69	1,824 05	.....	1,824 05	1,217 16	893 16	624 62	Simcoe.
.....	585 00	.....	585 00	.....	585 00	585 00	.....	.....	
.....	2,894 82	353 49	2,541 33	44 79	2,496 54	.....	.....	93 40	
314 95	.....	.....	.....	.....	.....	819 88	.....	.....	
480 76	.....	.....	.....	.....	.....	218 05	1,386 63	93 61	
.....	2,214 80	120 00	2,094 80	.....	2,094 80	750 00	.....	503 20	
.....	.....	.....	.....	.....	.....	.....	.....	961 60	
.....	2,176 86	240 00	1,936 86	.....	1,936 86	.....	.....	2,176 86	
490 16	2,262 31	908 02	1,354 29	.....	1,354 29	819 12	750 07	887 33	Stormont,
.....	1,488 50	.....	1,488 50	.....	1,488 50	.....	.....	1,000 00	Dundas
49 30	.....	.....	.....	.....	.....	.....	.....	609 90	and Glen-
71 60	970 75	622 56	348 19	.....	348 19	125 91	24 69	15 04	garry.
192 76	.....	.....	.....	.....	.....	106 95	631 30	91 37	
125 00	3,435 10	797 62	2,637 48	13 74	2,623 74	750 00	.....	92 64	
.....	.....	.....	.....	.....	.....	.....	.....	653 65	
.....	.....	.....	.....	.....	.....	.....	.....	1,938 81	
670 01	3,652 98	1,783 40	1,869 58	.....	1,869 58	3,077 63	.....	565 58	Sudbury.
.....	500 00	.....	500 00	.....	500 00	500 00	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	
238 50	1,502 69	98 99	1,403 70	.....	1,403 70	1,191 01	.....	.....	
114 47	.....	.....	.....	.....	.....	368 62	.....	.....	
.....	1,409 48	.....	1,409 48	.....	1,409 48	150 00	.....	112 70	
.....	.....	.....	.....	.....	.....	450 00	.....	446 70	
.....	.....	.....	.....	.....	.....	.....	.....	250 08	
1,232 54	6,178 46	2,425 27	3,753 19	.....	3,753 19	3,757 17	.....	2,681 76	Thunder
.....	760 00	.....	760 00	.....	760 00	500 00	.....	.....	Bay.
8 00	.....	.....	.....	.....	.....	.....	.....	332 50	
288 05	1,730 78	108 00	1,622 78	.....	1,622 78	1,700 58	.....	.....	
183 10	.....	.....	.....	.....	.....	406 10	.....	.....	
163 01	2,683 86	568 77	2,115 09	.....	2,115 09	150 00	.....	577 98	
125 00	.....	.....	.....	.....	.....	450 00	.....	1,045 40	
40 53	.....	.....	.....	.....	.....	.....	.....	446 79	
308 66	1,396 31	225 40	1,170 91	.....	1,170 91	568 28	577 96	246 72	Victoria.
.....	492 20	.....	492 20	.....	492 20	.....	.....	492 20	
.....	.....	.....	.....	.....	.....	.....	.....	.....	
.....	153 99	.....	153 99	.....	153 99	.....	.....	153 99	
44 00	847 98	120 00	727 98	.....	727 98	158 00	.....	12 00	
197 30	.....	.....	.....	.....	.....	110 25	546 90	46 78	
.....	2,163 42	504 50	1,658 92	.....	1,658 92	675 00	.....	62 20	
.....	.....	.....	.....	.....	.....	.....	.....	425 55	
.....	.....	.....	.....	.....	.....	.....	.....	1,000 67	
437 82	2,067 94	808 69	1,259 25	.....	1,259 25	894 39	563 22	610 33	Waterloo.
.....	1,000 00	.....	1,000 00	.....	1,000 00	.....	.....	1,000 00	
.....	112 97	4 00	108 97	.....	108 97	.....	.....	243 80	
51 90	1,531 13	223 00	1,308 13	.....	1,308 13	415 05	28 00	.....	
32 00	.....	.....	.....	.....	.....	126 40	1,000 00	219 83	
.....	1,806 05	310 65	1,495 40	.....	1,495 40	675 00	.....	648 47	
.....	.....	.....	.....	.....	.....	.....	.....	526 96	
50	2,023 20	414 58	1,608 62	.....	1,608 62	.....	.....	2,057 65	

APPENDIX F.—Return of fees and emoluments of County Judicial

County and Town.	Office.	Officer.	Amount earned.	Salary paid by Province.	Total earnings and salary in all offices.	Total received for present years' salaries.
			$ c.	$ c.	$ c.	$ c.
WELLAND:						
Welland..	Sheriff	James Smith....	2,133 16	.....	2,133 16	1,657 48
	Surrogate Judge...	Judge Wells.....	622 25	.....	944 25	622 25
	Local Master.....	"	322 00	.....	....	290 00
	Crown Attorney ...	T. D. Cowper....	460 00	.....	2,795 46	286 00
	Clerk of the Peace.	"	2,335 46	.....	.....	1,387 08
	Local Registrar ...	J. E. Cohoe.....	247 50	800 00	2,555 20	1,047 50
	County Court Clerk	"	451 70	.....	.....	451 70
WELLINGTON:	Surrogate Regist'r.	"	1,056 00	.....	.....	1,056 00
Guelph ...	Sheriff	A. S. Allan	2,128 11	.....	2,128 11	1,653 07
	Surrogate Judge...	Judge Chadwick.	commuted	1,000 00	.....	1,000 00
	Local Master.... / Local Registrar..	A. M. McKinnon.	commuted	2,000 00	.....	2,000 00
	Crown Attorney...	H. W. Peterson..	526 49	....	2,543 89	293 49
	Clerk of the Peace.	"	2,017 40	.....	.....	1,842 22
	County Court Clerk	Wm. Carroll	344 59	.....	2,562 33	321 85
WENTWORTH:	Surrogate Regist'r.	"	2,217 74	.....	.....	2,117 32
Hamilton	Sheriff	J. T. Middleton..	5,377 25	.....	5,377 25	4,414 83
	Surrogate Judge...	Judge Snider.. .	1,500 00	.....	1,592 35	1,500 00
	"	Judge Monck....	1,000 00	.....	1,184 70	1,000 00
	Local Masters...	Judge Snider....	92 35	.....	.....	92 35
		Judge Monck....	184 70	.....	.....	184 70
	Deputy Registrar	*T. H. A. Begue. K.C.....	40 00	250 00	290 00	248 34
	Crown Attorney ...	S. F. Washington, K.C.....	3,022 10	.....	4,530 44	1,811 00
	Clerk of the Peace.	S. F. Washington, K.C.....	1,508 34	.....	.....	860 62
	Deputy Clerk of the Crown	T.H.A.Begue,K.C.	155 25	500 00	5,042 57	565 66
	County Court Clerk	"	1,244 44	.....	.....	1,244 44
	Surrogate Regist'r.	"	3,142 88	.....	.....	3,142 88
YORK:						
Tononto .	Sheriff	F. T. Daville....	8,515 21	.....	8,515 21	7,222 39
	Surrogate Judges	Judge Winchester	2,600 00	.....	2,600 00	.....
		Judge Morgan...	1,600 00	.....	1,600 00	.....
		Judge Morson ...	1,600 00	.....	1,600 00	.....
		Judge Denton ...	1,200 00	.....	1,200 00	.....
	Crown Attorney...	Jas. Baird, K.C..	6,629 00	.....	6,629 00	3,946 60
	Clerk of the Peace	H. E. Irwin, K.C.	8,748 27	.....	8,748 27	6,048 40
	County Court Clerk	John Richardson.	6,219 20	.....	6,219 20	6,218 60
	Surrogate Regist'r.	Joseph Tait	11,993 59	.....	11,993 59	11,993 59
TORONTO:						
	Sheriff	Fred'k Mowat...	18,121 95	.....	18,121 95	16,166 76
	Crown Attorney...	J.W.S.Corley,K.C.	commuted	5,000 00	.....	5,000 00

*Acting.

Officers throughout the Province of Ontario, etc.—Concluded.

Total received for past years' services.	Total receipts by officer from all his offices.	Total disbursements.	Net receipts.	Amount paid to Province under 10 Edw. VII., cap. 5.	Net income.	Earnings of each officer payable by the Province, the County, and the General Public respectively.			County.
						From Province.	From County.	From General Public.	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
541 45	2,198 93	805 00	1,393 93	.....	1,393 93	816 20	663 82	653 14	Welland.
.....	912 25	.....	912 25	.....	912 25	.....	.....	622 25	
.....	.....	.....	.....	.....	.....	.....	.....	322 00	
328 60	2,692 92	572 50	2,120 42	12 04	2,108 38	460 00	.....	.....	
691 24	.....	.....	.....	.....	.....	102 10	2,233 36	.....	
.....	2,555 20	422 10	2,133 10	.....	2,133 10	800 00	.....	247 50	
.....	.....	.....	.....	.....	.....	.....	.....	451 70	
.....	.....	.....	.....	.....	.....	.....	.....	1,056 00	
509 86	2,153 93	261 28	1,892 65	.....	1,892 65	816 75	589 31	722 05	Wellington.
.....	1,000 00	.....	1,000 00	.....	1,000 00	1,000 00	.....	.....	
.....	2,000 00	12 00	1,988 00	.....	1,988 00	2,000 00	.....	.....	
203 97	2,632 09	364 00	2,268 09	26 80	2,241 29	521 49	.....	5 00	
292 41	.....	.....	.....	.....	.....	111 40	1,700 00	206 00	
46 15	2,579 42	306 86	2,272 56	.....	2,272 56	.....	.....	344 59	
94 10	.....	.....	.....	.....	.....	.....	.....	2,217 74	
769 12	5,183 95	2,334 75	2,849 20	.....	2,849 20	2,687 70	607 06	2,082 49	Wentworth
.....	1,592 35	.....	1,592 35	.....	1,592 35	.....	.....	1,500 00	
.....	1,184 70	.....	1,184 70	.....	1,184 70	.....	.....	1,000 00	
.....	.....	.....	.....	.....	.....	.....	.....	92 35	
.....	.....	.....	.....	.....	.....	.....	.....	184 70	
41 66	290 00	125 00	165 00	.....	165 00	250 00	.....	40 00	
1,074 40	4,305 29	1,229 97	3,075 32	172 59	2,903 73	3,002 10	.....	20 00	
559 27	.....	.....	.....	.....	.....	508 95	983 39	16 00	
83 33	5,036 31	1,444 33	3,591 98	195 99	3,395 99	500 00	.....	155 25	
.....	.....	.....	.....	.....	.....	.....	.....	1,244 44	
.....	.....	.....	.....	.....	.....	.....	.....	3,142 88	
1,202 54	8,424 93	3,279 92	5,145 01	.....	5,145 01	7,275 48	661 69	1,398 73	York.
.....	.....	.....	2,600 00	.....	.....	2,600 00	.....	.....	
.....	.....	.....	1,600 00	.....	.....	1,600 00	.....	.....	
.....	.....	.....	1,600 00	.....	.....	1,600 00	.....	.....	
.....	.....	.....	1,200 00	.....	.....	1,200 00	.....	.....	
779 30	4,725 90	3,170 00	1,555 90	.....	1,555 90	5,954 32	481 66	193 02	
2,232 85	8,281 25	2,585 00	5,696 25	1,398 12	4,298 13	1,840 20	6,765 04	143 03	
70	6,219 30	2,193 30	4,026 00	413 00	3,613 00	.....	.....	6,219 20	
.....	11,993 59	2,895 94	9,097 65	4,587 88	4,509 77	.....	.....	11,993 59	
1,922 27	18,089 03	8,348 55	9,740 48	.....	9,740 48	4,036*66	†917 25	13,168 04	Toronto.
.....	5,000 00	.....	5,000 00	.....	5,000 00	5,000 00	.....	.....	

* $81.00 payable by Dominion Government.
† $502.00 payable by City of Toronto.

APPENDIX G.—Table showing the business of the High Court of Justice in York County during 1910, compiled from statements furnished by the officers at Osgoode Hall.

Writs of summons issued		1,396
Actions entered in Procedure Book commenced by writs issued during the year 1910		987
" " " " previous years		31
" " " otherwise than by writ		253
Præcipe Orders issued		884
Court " "		652
Chamber " "		2,702
Records passed		416
Actions entered for trial with Jury		117
" " without a Jury		290
Actions tried with a Jury		106
" without a Jury		348
Judgments entered in default of appearance or pleading		148
" " without trial		261
" " after trial		175
Interlocutory judgments		5
Total judgments entered		589
Judgments dismissing actions		67
" under Con. Rule 603		2
" " " 938		33
" " " 596		33
" in mechanics' lien actions		55
" of reference		36
" entered in respect of Writs issued in the year 1902		1
" " " " " 1903		1
" " " " " 1904		1
" " " " " 1905		1
" " " " " 1906		2
" " " " " 1907		9
" " " " " 1908		22
" " " " " 1909		187
" " " " " 1910		325
" entered on motion		40
Amount recovered on Judgments (exclusive of costs)	$1,110,314 15	
Amount of Taxed costs (including disbursements) on judgments of all kinds	$222,062 83	
Writs of Execution Fi. Fa. issued		542
" renewed, and Alias and Pluries Writs issued		128
Special writs (Habeas Corpus, etc.) issued		25
Amount of Jury fees paid City Treasurer	$357 00	
Petitions under The Quieting Titles Act		21
Certificates of Title under The Quieting Titles Act		11

Accountant's office:

Amount of moneys paid into Court	$1,830,558 51	
" " " out of Court	2,317,697 02	
Number of directions issued for payments of moneys into Court		1,285
" cheques issued		4,377
" certificates issued		200
" new accounts opened		852
" individual accounts		627
Orders issued by the Master in Ordinary, in Winding-up Matters		44

References brought into the office of the Master in Ordinary:

Trustee accounts	2
Partition or sale	2
Foreclosure	19
Administration	5
Title	0
Partnership	0
Alimony	2
Winding up	15
Lunacy	3
Executors	0
Mechanics' liens	0

APPENDIX G.—Table showing the business of the High Court of Justice in York County, etc.—Continued.

Damages	1
Redemption	1
Receiver	0
Settling conveyances	0
Specific performances	0
Accounts	12
	62

References before Official Referees—

Trial or assessment	1
Trustees and Executors' accounts	0
Winding up	14
Lunacy	5
Accounts	3
Mechanics' liens	155
Title	1
Partition or sale	0
Administration	0
Receivership	1
Foreclosure	0
Under Arbitration Act	0
Vendor and Purchaser	2
	182

Fees paid in law stamps (Stamps cancelled by Taxing officers not included):

Central office	Records and Writs Branch	$6,721 10	$8,465 65
	Judgment Branch	1,744 55	
Registrars' office	For Fee Fund	967 30	1,743 30
	For Shorthand Reporters' Fund	776 00	
Accountant's office			1,290 30
Official Referee Cameron's office			230 50
Office of the Inspector and Referee (Quieting Titles)			214 50
" Master in Ordinary			949 80
" Master in Chambers			2,116 30
" Registrar of the Court of Appeal			859 90
			$15,870 25

APPENDIX H.—Table showing the number of actions tried or otherwise disposed of by the Judges of the High Court of Justice and the Court of Appeal and the disposition thereof during the year ending Dec. 31st, 1910.

Trial Judges.	With a Jury.	Without a Jury.	Total.
Actions disposed of by the Judges of the King's Bench.	69	192	261
" " " " Chancery.....	85	192	277
" " " " Common Pleas	64	150	214
" " " " Exchequer...	77	196	273
Totals	295	730	1,025

Judges in Chambers.	Allowed or varied.	Dismissed.	Standing for Judgment.	Total.
Toronto:				
Appeals from the Masters in Chambers	23	29	.....	52
" Local Masters and other officers acting in Chambers.....	12	10	.....	22
Appeals from Official Referees.....	.....	.....	.....	.....
" Local Taxing Officers	.....	1	... .	1
" Taxing Officers at Toronto.....	.....	3	.....	3
Motions, other than appeals	.....	....	.....	1,320
Ottawa:—				
Appeals from Local Masters and other officers acting in Chambers	.....	.....	.....	.....
Appeals from Taxing Officers	.....	.....	.....	.....
Motions, other than appeals	28	2	....	30
London;—				
Appeals from Local Masters or other officers acting in Chambers.....	.....	.....	.....	.....
Motions, other than appeals	37	8	.....	45
Totals	100	53	.....	1,473

Weekly Courts.	Allowed.	Dismissed.	Standing for Judgment.	Total.
Toronto:—				
Appeals from reports of Local Masters and Official Referees	12	19	1	32
Appeals from awards and motions to set aside awards	.....	2	.....	2
Motions, other than appeals	583	80	14	677
Number struck off the list, no one appearing	.....	.....	.....	13
" of motions enlarged.....	.....	.....	.....	235
" " " stayed.....	.....	.....	.....	1
Ottawa:—				
Appeals from Local Judge	.....	1	....	1
Appeals from reports of Local Masters and Official Referees	.....	.....	.....	.....
Motions, other than appeals.....	14	1	.....	15
London:—				
Motions, other than appeals	10	1	.. ..	11
Appeals from reports of Local Masters and Official Referees	1	3	.....	4
Totals	619	107	15	991

Master in Chambers:—

Motions in respect of pleadings, for particulars, for discovery and for commissions to take evidence.....	378
Motions in respect of venue, to set aside jury notices and notices of trial and proceedings under quo warranto	64
Motions for judgments and orders.....	472
Motions, setting aside judgments or orders, staying trials, and dismissing actions ...	474
Miscellaneous motions	314
Ex parte motions	189
Total...	1,891

APPENDIX H.—Table showing number of actions tried, etc.—Continued.

Divisional Court.	Allowed.	Dismissed.	Varied.	Standing for Judgment.	Total.
Appeals from Trial Judges	33	125	8	10	176
Appeals from Weekly Courts and Chambers	10	47	4		61
Appeals from County and District Courts	35	85	9		129
Appeals from Surrogate Courts	2	4			6
Appeals from Division Courts		3			3
Appeals under special statutes	4	9			13
Motions to quash convictions					6
Motions, other than above					168
Totals	82	269	21	10	556

Court of Appeal.	Allowed.	Dismissed.	Varied.	Standing for		Withdrawn.	Total.
				Argument.	Judgment.		
Appeals from Single or Trial Judges	15	24		8	13		60
Appeals from Divisional Courts	11	18		1	9		39
Appeals from Board of County Judges							
Appeals from Arbitrators			1			1	2
Appeals from Drainage Referee	1						1
Appeals from the Ontario Railway and Municipal Board		1					1
Election Trial appeals							
Habeas Corpus appeals	1	1					2
Reserved or criminal cases	3	13					16
Stated cases	2	1				1	4
Appeals from Surrogate Courts		1					1
Appeals from Mining Commissioner							
Motions to full Court	11	13			1		25
Totals	44	71	1	9	23	2	151

APPENDIX "I."

TABLE showing the business in the office of the Surrogate Clerk, Osgoode Hall, Toronto, for the year ending December 31st, 1910.

	No.
Probate Certificates issued	4,606
Administration Certificates issued	2,523
Guardianship Certificates issued	146
Caveats fyled	88
Elections received under R.S.O. cap. 128, sec. 20	0

Fees paid in law stamps, $3,876.50.

APPENDIX J.—Table showing the Criminal business of the High Court of Justice at its sittings throughout the Province during the year 1910.

County or District.	Bills.		Nolle prosequi.	Indictments quashed.	Traversed to the Sessions.	Number of persons pleading guilty.	Number of persons tried by the Judges of the								Verdicts after trial.				Number of days of sittings.
							King's Bench.		Chancery.		Common Pleas.		Exchequer.						
	True.	No.					With a Jury.	Without a Jury.	With a Jury.	Without a Jury.	With a Jury.	Without a Jury.	With a Jury.	Without a Jury.	Guilty.	Not guilty.	Disagreed.	Reserved.	
Algoma	1	....	..	..	..	..	1	....	....	....	....	....	....	....	..	1	..	1	...
Brant	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Bruce	2	2	..	..	..	..	1	....	....	....	....	....	1	....	..	2	..	..	10
Carleton	*3	....	..	..	..	..	....	....	....	....	....	....	2	....	1	..	..	..	20
Dufferin	....	....	..	..	..	..	....	....	....	....	....	....	1	....	1	..	..	..	3
Elgin	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Essex	1	....	..	..	..	5	2	....	3	....	....	....	1	....	1	..	..	..	2
Frontenac	4	2	..	..	..	..	....	....	....	1	....	....	....	....	1	..	..	..	4
Grey	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Haldimand	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Halton	4	1	..	..	..	..	....	....	....	....	....	....	2	....	2	..	..	..	7
Hastings	1	....	3	..	..	1	....	....	....	....	1	....	1	....	..	2	..	..	7
Huron	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Kenora	1	....	..	..	..	1	....	....	....	....	....	....	....	....	..	1	..	..	2
Kent	1	1	..	..	..	1	....	....	....	....	....	....	....	1	1	..	..	..	1
Lambton	1	....	..	..	..	..	....	....	1	....	....	....	....	....	1	..	..	..	3
Lanark	2	....	..	..	..	..	....	....	1	....	....	....	1	....	1	1	..	..	5
Leeds and Grenville	2	....	..	..	1	..	....	....	1	....	....	....	....	....	1	..	..	..	6
Lennox and Addington.	2	....	..	..	..	..	2	....	....	....	....	....	....	....	..	2	..	..	4
Lincoln	2	....	..	..	..	.	1	....	....	....	....	..	1	....	..	2	..	..	8
Manitoulin	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Middlesex	4	....	..	..	..	..	....	....	1	....	....	3	....	....	1	3	..	..	5
Muskoka	10	....	..	..	..	1	1	....	3	....	....	....	....	....	2	8	..	..	7
Nipissing	8	2	7	..	..	..	....	....	3	....	....	....	4	....	5	2	..	..	10
Norfolk	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Northumberland & D'm	12	1	8	..	..	..	1	....	....	....	3	....	....	....	3	1	..	..	8
Ontario	†7	....	..	..	..	1	2	....	....	....	1	....	....	....	4	..	..	..	14
Oxford	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Parry Sound	2	....	..	..	1	..	....	....	....	....	....	....	1	....	1	..	..	..	5
Peel	4	....	..	..	..	..	2	....	....	....	....	....	....	....	1	1	..	..	9
Perth	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Peterborough	2	....	..	..	..	..	1	....	1	....	....	....	....	....	2	..	..	..	3
Prescott and Russell	5	....	..	..	4	..	1	....	....	....	2	....	....	....	1	..	..	..	6
Prince Edward	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Rainy River	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Renfrew	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Simcoe	2	....	..	..	..	..	2	....	....	....	....	....	....	....	2	..	..	..	3
Stormont, D's and G'y.	1	1	..	..	..	..	....	....	....	....	....	....	1	....	1	..	..	..	2
Sudbury	5	1	..	..	..	1	....	....	....	4	....	....	....	....	3	1	..	..	6
Thunder Bay	10	....	..	..	..	3	6	....	4	1	....	....	....	....	7	4	..	..	10
Victoria	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Waterloo	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Welland	....	....	..	..	..	..	....	....	....	....	....	....	....	....	..	..	..	..	...
Wellington	2	....	..	..	..	..	2	....	....	....	....	....	....	....	..	2	..	..	10
Wentworth	2	....	..	..	..	..	....	....	2	....	....	....	....	....	2	..	..	..	1
York	8	1	..	..	..	..	8	....	....	....	....	....	....	....	9	1	..	..	13
Totals	111	12	18	..	6	14	33	....	20	6	9	3	16	1	54	34	..	1	194

* One case traversed to Spring Assizes, 1911. † Four cases traversed to Spring Assizes, 1911.

APPENDIX K.—Table showing the business of the Courts of General Sessions of the Peace and of the District and County Court Judge's Criminal Courts of the Province for the year 1910.

County or District.	Bills in Sessions.		Cases C. C. J. C. C.	Number of Persons Pleading Guilty.		Number of Persons Tried.		Verdicts after Trial.					Persons Accused.				Days of Sittings.	
						With Jury.	Without Jury.	Guilty.		Not Guilty.		Disagreed.	Sessions.		C. C. J. C. C.			
	True.	No.		Sessions.	C. C. J. C. C.	Sessions.	C. C. J. C. C.	Sessions.	C. C. J C. C.	Sessions.	C. C. J. C. C.		Male.	Female.	Male.	Female.	Sessions.	C. C. J. C. C.
Algoma		2	51		10		51		20		31		1	1	51		4	27
Brant	4		18			6	19	1	7	5	9		7		18	2	3	13
Bruce			8		5		3				3	3			8		2	7
Carleton	1	1	6		1	1	6		3	1	2		1		7		6	14
Dufferin			7		7		7		3		4				6	1		4
Elgin	3		7	1	1	2	7	2	5	1	2		3		5	2	7	4
Essex	3	2	23			2	23		5	2	18	20	5		17	1	5	12
Frontenac	1		13		3	1	8		2	2	1		1		13		4	11
Grey	5		19		5	3	15	1	5	2	9		5		16		6	23
Haldimand	1		25		9	1	25	1	19		6		1		25		2	38
Halton	2		4		2	2	2		2	2			2		4		3	7
Hastings	6	1	54		19	4	54	2	35	2	19		2	2	25	5	6	35
Huron			22		13		9		6		3	7			22		5	42
Kenora		1	8		3		8		6		2		1		8		1	9
Kent	6		21		10	6	18	2	12	3	9	6		6	21		4	11
Lambton	2		28		20	2	28		21		7	1	4		26	2	2	28
Lanark	1		6		4	1	6	1	5		1		1		6		2	6
Leeds and Grenville	2		47		21	1	29		13	1	14	16	1		47		4	90
Lennox and Addington			1	1	1		1		1						1			3
Lincoln	3		14		2	2	15		18	2	4		3		17		4	27
Manitoulin	1		1			2	1	2	1				3		1		3	3
Middlesex	3	1	58		34	2	66		10	2	22		4		65	1	9	89

Muskoka	8		9	1		4	10	2	10	2			7		9	1	5	6
Nipissing	9	1			5	9	4	6	8	2	6	1	10		14		8	14
Norfolk			8		5		7		6		2				7		2	6
Northumberland and Durham			30		9		27		9		11				26	1	4	41
Ontario			20		7		23		19		4				22	1	2	47
Oxford	3		8			3		1	8	1		1		4	8			
Parry Sound	4	1	6			4	4	2	3	2	1		6		6		4	5
Peel	4		17		6	3	17	3	4		7		3		16	1	4	23
Perth	3		3	1	2	2	3	1	1	1			3		3		5	2
Peterborough	4		6			3	6	1	4	2	2	1	3		5	1	4	5
Prescott and Russell	2					1	2	1	2						2		4	2
Prince Edward			3		2		3		2		1				3		2	3
Rainy River	10		28	5	16	6	11	5	5	1	6		10		28		9	28
Renfrew			4		1		4		2		2				4			6
Simcoe	3	1	17		8	4	17	1	13	3	4		4		17		18	34
Stormont, Dundas and Glengarry	5		5	2	3	3	2	1	2	2			5		5		7	6
Sudbury	4	1	15		1	4	10	1	6	4	4		4		9	1	4	9
Thunder Bay	3		18		1	3	17	3	12		6		3		18		6	21
Victoria	6		1	1	1	6	1	2	1	4			5	1	1		9	1
Waterloo	1		17		3	1	16		5	1	5	3	3		17		5	17
Welland	*2		6		3		6		5		1		*2		6		*2	6
Wellington			12				12		8		4				12			22
Wentworth	6	1	100		39	6	61	1	27	4	34	1	4	2	94	6	10	42
York	202	13	156	68	88	97	67	51	27	37	37	7	170	23	116	39	105	94
Totals	323	26	533	80	370	197	731	94	388	91	303	67	287	39	857	65	301	943

* Trial postponed.

APPENDIX "L."

Officers Appointed During the Year 1910.

Sheriffs.

Daniel George MacMartin, of the Town of Perth, in the County of Lanark, to be Sheriff in and for the County of Lanark, in the room and stead of William McGarry, Esquire, deceased.—*Gazette, 23rd April.*

David M. Jermyn, of the Town of Wiarton, in the County of Bruce, Esquire, to be Sheriff of the said County of Bruce, in the room and stead of Charles Vine Parke, deceased.—*Gazette, 17th December.*

Master-in-Ordinary and Local Masters.

George Oscar Alcorn, of the Town of Picton, in the County of Prince Edward, King's Counsel, to be Master-in-Ordinary of the Supreme Court of Judicature for Ontario, in the room and stead of Thomas Hodgins, Esquire, deceased.—*Gazette, 5th February.*

Thomas Scullard, of the City of Chatham, in the County of Kent, Esquire, Barrister-at-Law, to be Local Master of the Supreme Court of Judicature for Ontario, in and for the County of Kent, in the room and stead of His Honour Judge Bell, resigned.—*Gazette, 9th April.*

Crown Attorney and Clerk of the Peace.

John Farquhar MacGillivray, of the Town of Kenora, in the District of Kenora, Esquire, Barrister-at-Law, to be Crown Attorney and Clerk of the Peace in and for the Provisional Judicial District of Kenora, in the room and stead of Philip Edward MacKenzie, Esquire, resigned.—*Gazette, 11th June.*

Local Registrar.

Theodore A. McGillivray, of the Town of Whitby, in the County of Ontario, Esquire, Barrister-at-Law, to be Registrar of the High Court, Clerk of the County Court and Registrar of the Surrogate Court in and for the said County of Ontario, in the room and stead of John Ball Dow, Esquire, deceased.—*Gazette, 26th March.*

Police Magistrates.

Jonathan Hall Shields, of the Town of Oakville, in the County of Halton, Esquire, to be Police Magistrate in and for the said Town of Oakville, and the Township of Trafalgar, in the said County of Halton.—*Gazette, 1st January.*

Jonathan Hall Shields, of the Town of Oakville, in the County of Halton, Police Magistrate in and for the said Town of Oakville, and the Township of Trafalgar, in the said County of Halton, to be Police Magistrate in and for the said County of Halton.—*Gazette, 22nd January.*

Edward Reith, of the Town of Rainy River, in the District of Rainy River, Esquire, to be Police Magistrate in and for the said Town of Rainy River, having

Jurisdiction in such town and generally in the Provisional Judicial District of Rainy River under directions from time to time in that behalf, in the room and stead of Thomas Peare Morton, Esquire, resigned, said appointment to take effect on and from the first day of January, 1910.—*Gazette, 8th January.*

JOHN LAWRENCE PATERSON, of the Town of Ingersoll, in the County of Oxford, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said Town of Ingersoll, in the room and stead of John Morrison, Esquire, resigned.—*Gazette, 8th January.*

WILLIAM ALEXANDER MATHIESON, of the Village of Port Rowan, in the County of Norfolk, Esquire, to be Police Magistrate in and for the said Village of Port Rowan, in the room and stead of S. H. Harding, Esquire.—*Gazette, 15th January.*

WILLIAM HENRY CROSS, of the Town of Gravenhurst, in the District of Muskoka, Esquire, to be Police Magistrate in and for the said Town of Gravenhurst.—*Gazette, 22nd January.*

LEVI WILLIAMS, of Waupoos East Post Office, in the County of Prince Edward, Esquire, to be Police Magistrate in and for the Town of Picton and the said County of Prince Edward, in the room and stead of George Calvin Curry, Esquire, deceased.—*Gazette, 29th January.*

WILLIAM WAITE PATTERSON, of the Town of Paris, in the County of Brant, Esquire, to be Police Magistrate in and for the said Town and for the Townships of Brantford, South Dumfries and Burford.—*Gazette, 5th February.*

EDWARD JUSTUS PURCELL, of the Village of Athens, in the County of Leeds, Esquire, to be Police Magistrate in and for the said Village of Athens.—*Gazette, 5th February.*

STEPHEN FOURNIER, of the Town of Sudbury, in the District of Sudbury, Esquire, to be Police Magistrate in and for the Provisional Judicial District of Sudbury, *pro tempore.—Gazette, 19th February.*

W. J. BAULDRY, of the Town of Cochrane, in the District of Nipissing, to be Police Magistrate in and for the said Town of Cochrane and the Townships of Clute, Glackmeyer, Kennedy, Fournier, Lamarche, Brower, Fox, Reaume, Hanna, St. John, and Pyne, in the room and stead of William S. Hugh, Esquire, resigned.—*Gazette, 12th March.*

CAMBRIDGE W. HAWKSHAW, of the Village of Lucan, in the County of Middlesex, Esquire, to be Police Magistrate in and for the said Village of Lucan and the Township of Biddulph.—*Gazette, 19th March.*

AMOS CHARLES VAUGHAN, of the Village of Superior Junction, in the Provisional Judicial District of Kenora, to be Police Magistrate in and for the said Provisional Judicial District of Kenora, and to exercise jurisdiction in the said District along the National Transcontinental Railway for seventy miles west of Superior Junction, and east along the National Transcontinental Railway fifty miles, more or less, to the east boundary of the said District, and south-easterly along the Superior branch of the Grand Trunk Pacific Railway sixty miles, more or less, to the west boundary of the said District; said appointment to take effect on and from the 1st day of March, 1910.—*Gazette, 16th April.*

RICHARD ANDREW DOUGLAS, of the Town of Matheson, in the District of Nipissing, Esquire, to be Police Magistrate in and for the said Town of Matheson and in and for the territory in the vicinity thereof in the Districts of Nipissing and Sudbury, composed of the following Townships, namely:—Shaw, Gowan, Stock, Mountjoy, Hislop, McCann, Walker, Wilkie, McCool, Hoyle, Cody, Nark, Teefy, Tully, Crawford, Newmarket, Moody, Burnet, Thomas, Evelyn, Taylor,

Godfrey, Bowman, Currie, Playfair, Coulson, Macdiarmid, Matheson, Knox, Calvert, Prosser, Lucas, Aurora, Galna, Whitney, Michaud, Sheraton, Dundonald, Carr, Jamieson, Jessop, Bond, Cook, Milligan, Kidd, Rickard, McCart, Carnegie, Duff, Edwards, German, Tisdale, Guibord, Egan, Clergue, Beatty, Munro, Murphy, Macklem, Warden, Kerrs, Mahaffy, Little, Reid, Mann, Wesley, also in and for the territory composed of the three unnamed Townships lying south of the Townships of Tisdale, Mountjoy, and Godfrey.—*Gazette, 16th April.*

Adolphus Jackel, of the Town of Midland, in the County of Simcoe, Esquire, to be Police Magistrate in and for the said Town of Midland, in the room and stead of Frederick William Jeffrey, Esquire, resigned.—*Gazette, 14th May.*

Arthur Burwash, of the Town of Arnprior, in the County of Renfrew, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said Town of Arnprior, in the room and stead of John Tierney, Esquire, resigned.—*Gazette, 18th June.*

Frederick D. Boggs, of the Town of Cobourg, in the County of Northumberland, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said Town of Cobourg, in the room and stead of Henry F. Holland, Esquire, deceased.—*Gazette, 18th June.*

Robert Fleck, of the Town of Sarnia, in the County of Lambton, Esquire, to be Police Magistrate in and for the Village of Point Edward, the Township of Sarnia (including the Sarnia Indian Reserve) and the Township of Moore.—*Gazette, 18th June.*

Henry White, of the Town of Port Hope, in the County of Durham, Esquire, Barrister-at-Law, to be Police Magistrate in and for the said Town of Port Hope and for the Electoral District of East Durham, in the room and stead of R. H. Holland, Esquire, deceased.—*Gazette, 25th June.*

Frederick Scott, of the Village of Westport, in the County of Leeds, Esquire, to be Police Magistrate in and for the said Village of Westport, and in and for the Township of North Crosby, in the said County of Leeds, in the room and stead of James R. Gorrell, resigned.—*Gazette, 16th July.*

Thomas Edward Williams, of the Town of Thessalon, in the District of Algoma, Esquire, Police Magistrate in and for the said District of Algoma, to be Police Magistrate in and for the District of Sudbury.—*Gazette, 30th July.*

John Taylor MacKay, of the Town of Sault Ste. Marie, in the Provisional Judicial District of Algoma, Esquire, to be a Police Magistrate in and for the said Provisional Judicial District of Algoma.—*Gazette, 24th September.*

Adolphus Eugene Landrian, of Gowganda, in the District of Nipissing, Esquire, to be Police Magistrate in and for Gowganda, and in and for the Territory in the vicinity thereof, being composed of the Gowganda Mining Division, as established by Order-in-Council of 10th February, 1909, in the room and stead of James Patrick McGregor, resigned.—*Gazette, 29th October.*

John Strachan Lewis McNeely, of the Town of Carlton Place, in the County of Lanark, Esquire, to be Police Magistrate in and for the said Town of Carlton Place.—*Gazette, 5th November.*

Joseph Easson Depew, of White River, in the District of Algoma, Esquire, to be Police Magistrate in and for the Provisional Judicial Districts of Sudbury, Algoma and Thunder Bay, subject, however, to the condition that his jurisdiction be restricted to the territory lying between the westerly boundary of Chapleau and the westerly boundary of Schreiber.—*Gazette, 13th November.*

George W. Bartlett, of Algonquin Park, in the District of Nipissing, Esquire, to be Police Magistrate in and for the Provisional Judicial District of Nipissing, without salary.—*Gazette, 3rd December.*

John Edwin Dobie, of the Town of Walkerville, in the County of Essex, Esquire, to be Police Magistrate in and for the said Town of Walkerville.—*Gazette. 17th December.*

Associate Coroners.

Charles Westlake Hoare, of the Town of Walkerville, in the County of Essex, Esquire, M.D., to be an Associate Coroner in and for the County of Essex.—*Gazette, 8th January.*

Frederick John Weidenhammer, of Hawkesville P. O., in the County of Waterlo, Esquire, M.D., to be an Associate Coroner in and for the County of Waterloo.—*Gazette, 15th January.*

Robert Jesse Teeter, of the Village of Villa Nova, in the County of Norfolk, Esquire, M.D., to be an Associate Coroner in and for the said County of Norfolk.—*Gazette, 5th February.*

Archibald Duncan McArthur, of Blackstock P. O., in the County of Durham, Esquire, M.D., to be an Associate Coroner in and for the United Counties of Northumberland and Durham.—*Gazette, 12th February.*

Edward Meek, of the Village of Port Rowan, in the County of Norfolk, Esquire, M.D., to be an Associate Coroner in and for the said County of Norfolk.—*Gazette, 26th February.*

Frederick William Hill, of the Village of Roslin, in the County of Hastings, Esquire, M.D., to be an Associate Coroner in and for the said County of Hastings.—*Gazette, 5th March.*

Harry Belfor Andrew, of the Village of Sundridge, in the District of Parry Sound, Esquire, M.D., to be an Associate Coroner in and for the said District of Parry Sound.—*Gazette, 9th April.*

Frederick Hyde Bethune, of the Village of Emo, in the District of Rainy River, Esquire, M.D., to be an Associate Coroner in and for the said District of Rainy River.—*Gazette, 9th April.*

Albert Carman Ricker, of the Village of Mimico, in the County of York, Esquire, B.A., M.B., to be an Associate Coroner in and for the said County of York.—*Gazette, 7th May.*

Richard Raikes, of the Town of Midland, in the County of Simcoe, Esquire, M.D., to be an Associate Coroner in and for the District of Muskoka.—*Gazette, 18th June.*

Allan Roy Dafoe, of the Village of Callender, in the District of Parry Sound, Esquire, M.B., to be an Associate Coroner in and for the said District of Parry Sound.—*Gazette, 25th June.*

Joseph Patterson Quigley, of Killaloe Station P. O., in the County of Renfrew, Esquire, M.D., to be an Associate Coroner in and for the said County of Renfrew.—*Gazette, 25th June.*

Arthur C. Johnston, of the Village of Gowganda, in the District of Nipissing, Esquire, M.D., to be an Associate Coroner in and for the said District of Nipissing.—*Gazette, 9th July.*

Horace B. Elliott, of the City of Niagara Falls, in the Couny of Welland, Esquire, M.D., to be an Associate Coroner in and for the said County of Welland.—*Gazette, 16th July.*

Archibald Henderson, of the Town of Cochrane, in the District of Nipissing, Esquire, M.D., to be an Associate Coroner in and for the said District of Nipissing.—*Gazette, 30th July.*

Frank Sidney Roundthwaite, of the Township of Tecumseth (Cookstown P. O.), Esquire, M.D., to be an Associate Coroner in and for the County of Simcoe.—*Gazette, 10th September.*

John James Harper, of the Town of Alliston, in the County of Simcoe, Esquire, M.D., to be an Associate Coroner in and for the said County of Simcoe.—*Gazette, 10th September.*

Stanley Hayden Smith, of the Village of Streetsville, in the County of Peel, Esquire, M.D., to be an Associate Coroner in and for the said County of Peel.—*Gazette, 17th September.*

Frederick W. Mulligan, of the Town of Petrolia, in the County of Lambton, Esquire, M.D., to be an Associate Coroner in and for the said County of Lambton.—*Gazette, 29th October.*

Mark MacGregor Farnham, of the Town of Copper Cliff, in the District of Nipissing, Esquire, B.A., to be an Associate Coroner in and for the said District of Nipissing.—*Gazette, 5th November.*

William Robert Patterson, of the Town of Sudbury, in the Judicial District of Sudbury, Esquire, M.D., to be an Associate Coroner in and for the said Judicial District of Sudbury.—*Gazette, 5th November.*

Victor Wardlo McCormack, of the Town of North Toronto, in the County of York, Esquire, M.D., to be an Associate Coroner in and for the said County of York.—*Gazette, 10th December.*

Osman Amos Pogue, of the Village of Minden, in the Provisional Judicial District of Haliburton, Esquire, M.D., to be Associate Coroner in and for the said Provisional Judicial District of Haliburton.—*Gazette, 17th December.*

Leonard Hugh Douglas, of the Village of Springfield, in the County of Elgin, Esquire, M.D., to be an Associate Coroner in and for the said County of Elgin.—*Gazette, 17th December.*

ANNUAL REPORT

OF THE

Inspector of Registry Offices

FOR THE

PROVINCE OF ONTARIO

1910

PRINTED BY ORDER OF

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1910

GUELPH, 11th March, 1911.

TO THE HON. J. J. FOY, K.C.,

Attorney-General for the

Province of Ontario.

SIR:—I beg to present my Report as Inspector of Registry Offices for the past year.

The Registrars' Returns for the year 1910 show, amongst other results, the following:—

Total number of instruments registered in 1910	192,877
Total number of instruments registered in 1909	174,703
Increase	18,174
Gross amount of fees received in Registry Offices in 1910 ..	$299,009.88
Gross amount of fees received in Registry Offices in 1909 ..	208,439.45
Increase	$90,570.43
Net amount of fees received in Registry Offices in 1910	$130,963.48
Net amount of fees received in Registry Offices in 1909	117,478.16
Increase	$13,485.32

Appended hereto is a copy of the tabulated statement from the Registrars' Returns giving particulars of the fees and emoluments of the different Registry offices.

The revised Registry Act, which came into force on the first September last is not only more conveniently arranged than was the former Act, but it, of course, embodies all the amendments to the Registry Laws down to 1910.

Some of the changes made in the new Act have already given rise to a number of questions for my opinion. But I have not had many more than the usual number of such questions and disputes submitted to me, and I have no hesitation in saying that the public have reason to be satisfied, as I am satisfied, with the manner in which the Registrars generally perform their duties.

As usual, I now send to you with this Report notes of some of my decisions on questions of disputed fees and the like, and of some of the opinions I have given, including a number of points which have arisen under the Revised Act.

I deem it desirable, also, for the information, especially of the recently appointed Registrars or Deputy Registrars, to call attention in this report to the following, amongst other directions and instructions I have given:—

1. While Solicitors are now very generally following the requirements of the new Registry Act in respect to Affidavits of Execution of instruments (Form 5), still many instances occur where apparently their attention has not been called to the difference between Form 5 of the new Act and Form Schedule "G" of the old Act. It is not uncommon to find that the added words in Clause 2 of Form 5 of the present Act have been left out of the affidavit, namely: after the word "executed" the words "by the said party." Registrars should insist on substantial compliance with the new form.

2. Under the new Registry Act, Affidavits of Execution, whether made out of Ontario or not, may be made before any person authorized by law to take affidavits in and for Ontario, so that by force of the Interpretation Act, section 20, and the Evidence Act, section 38, "Commissioners for Oaths" in England or in other Provinces of Canada and the like are now included amongst the officials who may take Affidavits for registration of instruments under our Registry Act.

3. Attention is directed to a difference in the wording of Certificates of Registration of instruments. In the present form of Certificate, Form 8 in the new Act, it states that the instrument is registered "in the Registry Office *for the Registry Division* of ," and it is the same with regard to a Discharge of Mortgage, Form 10. That should be addressed to "the Registrar of the *Registry Division* of ," and the Office should, in the body of the Discharge, be referred to as "the Registry Office of the *Registry Division* of ."

4. Affidavits proving execution of original Wills are sometimes defective in form. I repeat a former recommendation that Registrars should carefully scrutinize the contents of such affidavits to see that the provisions of the Wills Act are followed. The more convenient way is for Registrars to insist on substantial compliance with the forms of affidavits of execution of Wills required by the Surrogate Courts.

5. Where a Deputy Registrar or other Assistant is about to leave the service of a Registrar, the Registrar should see that proper Statutory Declarations are obtained from him to verify the copies of instruments in Registry Books where the Deputy or Assistant is the person who has done the comparing and who has initialed the comparing notes.

6. There appears to be no authority in the Registry Act for registering a Court Order by deposit of a copy of the Order. Such Order should be registered by Certificate, although if it is desired to register an original Court Order and the land is properly described therein, there is no substantial objection to such mode of registration treating the Order as an Instrument affecting land.

7. Registrars should note in the column for remarks in Abstract Indexes wherever a Conveyance is made subject to taxes or future possession, or to charges,

or a Vendors Lien for unpaid purchase money or the like; also where a Conveyance is only of a limited interest, such as for life, or of a half interest or the like.

8. Care should be taken where an instrument purports to be executed by Attorney, not merely to see that the Power of Attorney has been registered, but that the instrument is otherwise properly executed. For instance, I have found several cases of instruments on record where the Attorney purports to be the granting party, and he executes the instrument not in the name of his constituent, but in his own name as Attorney.

9. Where a Certificate of Dissolution of Partnership, consisting of several partners, is signed only by one partner or by less than the full number, while it may be registered, the facts should be noted by whom it is signed and that it does not purport to be signed by all.

10. A Plan subdividing lands into Lots for registration should not be what is known as a Blue Print copy, especially a Blue Print copy which purports to have mere copies of the signatures of the owners and surveyor. I do not consider that sufficient under section 80 of the Registry Act.

I respectfully recommend that the new Registry Act be printed in pamphlet form, with an Index, for distribution amongst Registrars and others.

I have the honour to be, Sir,

Your Obedient Servant,

(Sgd.) DON. GUTHRIE,

Inspector of Registry Offices.

DECISIONS BY DONALD GUTHRIE, K.C., INSPECTOR OF REGISTRY OFFICES.

DAMAGES PAID BY A REGISTRAR FOR HAVING FURNISHED A DEFECTIVE ABSTRACT CANNOT BE DEDUCTED BY HIM IN HIS RETURNS AS BEING A DISBURSEMENT INCIDENT TO THE BUSINESS OF HIS OFFICE. NOR CAN HE CHARGE THE COUNTY FOR ARREARS OF RENT OF TYPEWRITING MACHINES FOR PRICES OF WHICH HE HAD TAKEN CREDIT IN FORMER RETURNS. CHARGE FOR PREMIUMS ON GUARANTEE BOND.

Mr. W., County Solicitor for the County of X. has, on behalf of the County, taken objection to certain charges or deductions which the Registrar of Deeds for that County has made in connection with the returns of the fees of his Office, for the years 1908 and 1909.

The Returns in question are those which the Registrar is required to make under section 124 of The Registry Act. In such Returns, amongst other things, the Registrar is required to show the amount paid to the Deputy Registrar for services, and the amount of other charges in connection with the Office, paid by the Registrar; and under section 128 it is enacted for the purposes of the Act that "net income" shall mean the excess of all fees, etc. "after deducting the disbursements incident to the business of the Office."

The County Solicitor's objections, on behalf of the County, are to certain deductions which the Registrar has made in these Returns in arriving at, or from the net income of his Office.

I have had correspondence both with the County Solicitor and the Registrar and full statements showing the contentions of each in the matter.

The County Solicitor's objections are as follows:—

1. He states that in the Returns for the year 1908 it appears that the Registrar charged, as a proper disbursement or deduction, the sum of $450.00 which he paid to A. & Co. for damages claimed by them against the Registrar by reason of an omission from an Abstract of Title, which the Registrar had furnished to them in respect of certain property of which A. & Co. had registered a lien. From that Abstract a prior encumbrance had been omitted. Whether that omission arose from carelessness of the Registrar or one of his staff or how otherwise is not stated, and probably for present purposes that is not material.

The County claims that the Registrar was not, and he claims he was, justified in entering this sum of $450.00 in his returns, as a proper disbursement incident to the business of his Office.

I am clearly of opinion that the contention of the Registrar on this point is untenable. I do not think this $450.00 was a disbursement incident to the business of his Office within the meaning of section 128 of the Registry Act. It was a disbursement caused by the negligent or improper performance by the Registrar or his staff of their duties, and was not a disbursement incident to the business of the Office when properly conducted, which, I think, is the meaning of section 128.

2. The second objection taken by the County Solicitor is that in the Returns of the Registrar for 1909 there appears an item entered as a charge in connection with the fees for the rent of Typewriters, of $600.00.

The County claims that no such charge should be made. It says the prices of these machines appear in previous Returns of the Registrar; namely, in the Returns for the year 1900, $225.00 is charged for a Typewriter; in the Returns for 1907, $80.00 is charged for a Typewriter, and again in the Returns for 1908 the Registrar charged $80.00 for a Typewriting Machine.

The County Solicitor states that he understands from the Registrar that these are the only Machines he has in his Office and uses, and are those for which he is now charging $600.00 for rental, in addition to $50.00 paid Elliott Fisher for a Key Board and other repairs.

The Registrar replies in this connection as follows: "If instead of purchasing the three machines I now have, I had rented them from the United Typewriter Company I would have paid the $50.00 a year for each machine, and this payment I would have entered in my cash disbursements of the year, and I do not believe that it could be successfully argued that their use was not 'incident' to the transaction of the business of the Office, and this being so it would naturally follow that the rental paid for their use was a legitimate and proper expenditure. But instead of renting the machines I purchased them, it being more economical to do so. Am I not, then, as justly entitled to receive a rental on my investment as the Typewriter Company? I have three Typewriting Machines, the aggregate time of the three is over fifteen years, in each year as the purchase was made I entered the price in my disbursements, and of course it was carried forward and included in my Return. Last year I learned that it is the practice in those Offices where Typewriters are rented to include the sum paid for rental in their Returns. This opened my eyes to the fact that I also was entitled to this return on my investment, and in my return for 1909 I included the sum of $600.00 for rental, 12 years rental at $50.00 per year. You will observe I struck off over three years, as I had included in my return the cost of each machine in the three separate years in which they were purchased. This bunching of twelve years rental in one return is no hardship on the County, as the result would have been the same if I had from year to year entered up the rental. I gain nothing by the use of these machines, other than the satisfaction of a well-equipped, up-to-date Office and the approval of the legal profession over the change. The County, however, is a substantial gainer, as the use of the Typewriters saves them fully one-third in books, and as these large books are quite costly, the profit to them is very considerable, besides they have fared well under the Rebate Act. During the time it has been in force I have paid large rebates. I enclose a statement of the payments year by year, in buildings, books, and equipment. The County has not expended over one-third of the amount received from my Office."

I think the County is not liable for the sum of $600.00 charged as rent for the use of the typewriters. The prices of the machines were without objection on the part of the County, charged by the Registrar as disbursements incident to the business of the Office; and that, in my opinion, settles the question in this case. I do not see how the Registrar can now re-open it. This back rent cannot, I think, be allowed. Under the circumstances, there was no contract expressed or implied by the County to pay it, nor was it the duty of the County to provide typewriters.

The law has been amended so that after First September next the County may provide Typewriting machines for use in copying instruments in the Registry Books. A Registrar could not and cannot yet provide, without the authority or acquiescence of the County, typewriting machines, and charge the price to the County, or recover the cost from the County.

Whether he could, in different circumstances from those existing here, properly charge as part of the expenses incident to the business of the Office, something for the use or "rent" of typewriting machines which he had purchased, and himself had paid for, without charging or deducting such price in making up his returns, I am not now prepared to say.

I am aware that a charge for use or "rent," so-called, of such machines has been included by some Registrars in recent Returns, as one of the disbursements incident to the business of their Office under section 128. But I have understood that in such cases the Registrars themselves bought and paid for the machines or otherwise supplied them without having charged or deducted the price or cost of the machine in their Returns. No objection to such a practice in such circumstances has heretofore come before me and I express no opinion either way on the subject; except to say that I think the safer course for a Registrar to follow in the future will be to endeavor, now that the Act has been amended, to persuade the County itself to provide the machine or machines.

3. The County further questions the validity of a charge for the premium on the Guarantee Bond.

I had occasion to consider that question ten or eleven years ago, and I gave an opinion then, after consideration, that, on the whole, I thought the premium paid was a proper charge or disbursement incident to the Office of Registrar, within the meaning of section 128 of The Registry Act. That opinion is reported on page 17 of my report for the year 1899. I believe that opinion has been acted upon ever since, both by Registrars and Municipalities, and to that opinion I now adhere.

FEES FOR FILING SALVATION ARMY NOTICE UNDER 9 EDWARD VII., CAP. 159, AND FOR CERTIFICATE ON DUPLICATE.

A matter in difference respecting fees, which has arisen between Mr. R., Property Secretary of S. A., and the Registrar of the County of X., has been referred to me.

A Notice under section 2 of chapter 159, 9 Edward VII., was filed in the Registry Office. The Notice affected two separate Lots, which required two separate entries in the Abstract Index. The instrument was in duplicate. The charges made by the Registrar were as follows: 2 separate entries in Abstract Index, 50 cents; Certificate on duplicate, 25 cents; in all, 75 cents.

Mr. R., Property Secretary of the S. A., states his position as follows:—

"1. It was the intention of the Legislature to make this matter as easy as possible for the S. A., and thus their reducing the fee to Twenty-five cents for the said Notices. This I know to be the case, as it was discussed in the Committee.

"2. It was never the intention of the Ontario Government that these 'Notices' should cost more to register than the ordinary Deed, for which, when there is more than one Lot mentioned, the charge for each additional Lot is Five cents.

"3. I may add further that I am still of the impression, and in fact am quite sure, that it was never the intention of the Ontario Legislature that we should be charged an additional Twenty-five cents for putting the certificate on the duplicates of those 'Notices,' although we bowed to your ruling in this matter when you ruled otherwise in the case of Toronto."

Subsection 4 of section 2 of the Act referred to provides that the fee payable upon the filing of the Notice and the making of the entry shall be 25 cents for each entry in the Abstract Index, and in the Land Titles Register.

I am of opinion as follows:—

1. I think it clear under subsection 4 referred to that the Registrar is entitled to 50 cents for filing the Notice and making the entries in the Abstract Index. There being two Lots, two entries were necessary, one in respect of each Lot.

2. I adhere to the opinion I formerly gave that if the S. A. requires a Certificate from the Registrar upon a duplicate of the Notice, the Registrar is entitled to 25 cents for such Certificate.

I decide this matter, therefore, in favor of the Registrar.

In arriving at my decision I have construed the Statute as I find it, and I have endeavored to arrive at the intention of the Legislature from the language of the Act itself.

A Description of Lands which is Insufficient except by Reference to Another Instrument. Circumstances Exceptional.

A matter of difference has been referred to me which has arisen between Mr. G., Solicitor, and Mr. A., Registrar of X.

The question is whether the Registrar should or should not under the circumstances I am about to state have entered in the Abstract Index against Lot 46 on the North side of F. Street, a certain Mortgage made by G. to B.

It appears that a Deed and Mortgage, both dated 16th February, 1910, and both registered together on the 5th March, 1910, were given, the Deed made by B. to G., and the Mortgage back being made by G. to B. In the Deed the lands conveyed are properly described as Lot 47 and the East 5 feet of Lot 48 on the North side of F. Street. There are also granted by the Deed certain rights of way, one on the West side of the part of Lot 48 conveyed by the Deed, and another extending North over the East part of Lot 47 and the West part of Lot 46. These two rights of way are fully described in the Deed by metes and bounds. The Deed was registered against the three Lots, namely, 46, 47 and 48, and no question arises in respect of such registration. The difference which has arisen is in regard to the description in the Mortgage of the rights of way and the non-entry by the Registrar of the Mortgage in the Abstract Index as against Lot 46. The Mortgage is upon Lot 47 and the East 5 feet of Lot 48, and covers the rights of way by the following description:—

"Together with and subject to that certain right of way on the easterly side of the lands and premises hereby conveyed, or intended so to be, 7 feet 8 inches in breadth and extending back in a Northerly direction from F. Street aforesaid a depth of 73 feet all as fully described in a certain Deed of the said lands and premises to the said mortgagor, H. G., from one D. B., bearing date the 16th day of February, 1910, and also together with and subject to that certain other right of way on the westerly side of the said lands and premises 8 feet in breadth and extending back in a northerly direction from F. Street aforesaid a depth of 78 feet all as fully described in the said Deed of the said lands and premises to the said mortgagor, G., from the said B., bearing date the 16th day of February, 1910."

The Registrar registered the Mortgage, but only entered it in the Abstract Index upon Lots 47 and 48. He did not enter it in respect of the right of way on Lot 46. The Solicitor contends the Registrar should have entered the Mortgage also upon Lot 46. He thinks the right of way on Lot 46 is sufficiently described for registration under the Registry Act. He further takes the ground that, having accepted the Mortgage with the description therein and registered the same without objection, the Registrar ought to have entered it upon the Lot 46, and the question is now no longer open; and that whatever the Registrar's rights were in the first instance he is precluded by what has occurred from refusing to complete the registration of the Mortgage in respect of the right of way on Lot 46. The Registrar's contention is that under section 36 of The Registry Act the Mortgage should have mentioned the lands affected by giving the number of the Lot or by giving a sufficient description of the lands to justify him in entering it upon Lot 46; and that it does not contain in itself such description; nor does it, he considers, comply with the provisions of subsection 3 of section 100 of the Registry Act. He also cites reported decisions and opinions of my own in support of his view.

The Solicitor and Registrar have each very fully laid before me their different views, and I have been in that way much assisted in my consideration of this matter.

The question arising here is one of some nicety. I agree with the Registrar in thinking that the general rule favored by me, as he has gathered it from my reported opinions, tends to support his views in this case. If I shall hold that the language of the Mortgage in describing by reference the right of way over Lot 46 is sufficient for registration purposes I shall probably be carrying or extending the rule farther than I have hitherto done. But I cannot help thinking that the present case under all the circumstances is and must be treated as distinguishable from the reported opinions referred to; or as an exception to the general rule. Of course there can be no question that in law and fact the mortgage covers the right of way over Lot 46. The Registrar received the Mortgage, registered it without objection, and I presume gave his certificate of such registration without qualifying or limiting its terms. Then again the Deed to which the Mortgage refers was registered at the same time as the Mortgage; so that the Registrar could not and can not have any doubt as to what rights of way were intended to be covered by the description in the mortgage nor that the right of way upon Lot 46 was in fact included in the Mortgage. The instruments and their contemporary registration show that the mortgage was plainly intended to be a mortgage back on the same property as was covered by the conveyance. Then again, the mortgage having been registered, is it not the safer course for the Registrar to enter it upon Lot 46, as it covers the right of way upon that Lot? It cannot possibly work harm to anyone for the Registrar so to enter it. If my opinion in this case should support the Registrar's view, it would not afford protection to him, if it should turn out that my opinion was erroneous. If he does not note the instrument against Lot 46 and the Mortgagee in consequence suffers loss the Registrar may incur liability for damages.

On the whole, while the matter is not free from doubt, I have come to the conclusion that, under the circumstances of this case, the Registrar should enter the Mortgage in the Abstract Index under Lot 46; and so far as I have power so to do, I decide the matter accordingly.

MORTGAGE TAKEN BY A MORTGAGEE WHO IS DESCRIBED AS "ADMINISTRATOR OF A. B." THE ADMINISTRATORS OF SUCH A MORTGAGEE MAY GIVE A CERTIFICATE OF DISCHARGE OF MORTGAGE, BEING THE PERSONS ENTITLED BY LAW TO RECEIVE THE MORTGAGE MONEY.

My opinion has been applied for with regard to the sufficiency for registration purposes of the Discharge of Mortgage made by one B. (Mortgagor) to one M., who in the Mortgage is described as follows: "M., of the Town of U., in the County of O., Gentleman, Administrator of the Estate and effects of the late F. C. M., deceased."

The Discharge tendered for registration is made by J. I. and F. M., to whom letters of Administration of the Estate of W. M. were granted and have been registered. The question is: Have the administrators of M. the power to discharge the Mortgage by Certificate? The Solicitor concerned has sent me the original Mortgage for my perusal. It is a Mortgage made in pursuance of the Act respecting short forms of Mortgages. It is made to M. described as already mentioned. There is no other reference as to his being administrator except as follows: after the words "the mortgagor doth grant and mortgage unto the mortgagee, his heirs and assigns forever," are the words "in trust as aforesaid." There is no express statement that he takes "in trust as aforesaid," except it be by the words in his description after the word "Gentleman," stating that he is "the administrator of the estate and effects of the late F. C. M., deceased."

By the Short Forms of Mortgages Act the proviso for redemption provides for redemption upon payment to the mortgagee, his executors, administrators or assigns. The covenants are in the same way with him and his administrators. The covenant for payment of the Mortgage is that the mortgagor will pay the mortgage money to the mortgagee, his executors, administrators or assigns, and the other covenants and powers are all to be deemed to be expressed in the same way. The persons, therefore, who may receive payment of the mortgage according to these terms include the administrators of the mortgagee. Are they not, therefore, the persons entitled to receive the mortgage money? By the Registry Act, chapter 60, section 62, the person who may certify to the payment of a mortgage is the person who is by law entitled to receive the mortgage and "discharge the mortgage." I think this means that the person who is entitled to receive the money is to be deemed to be the person entitled to discharge the mortgage by certificate; and this view is strengthened by reference to the form of certificate of Discharge of Mortgage given in the Registry Act. That form provides that the persons signing the Discharge shall certify as follows: "That I am the person entitled by law to receive the money and that such mortgage is therefore discharged."

These administrators would not at common law have the power to re-convey the mortgage premises to the mortgagor. The power of administrators to give a valid discharge of mortgage by Certificate is entirely derived from the Registry Act; perhaps now strengthened by the Devolution of Estates Act.

In view of the contents of the mortgage showing that the mortgage is to be redeemed by payment to the mortgagee's administrators and the fact that this and the covenants for payment entitled the mortgagor to pay the administrators of the mortgagee and these administrators to receive the money, I think the administrators of M., the mortgagee, are the persons entitled by law to receive the Mortgage money in this case within the meaning of the Registry Act and are, therefore, the persons entitled to grant a Certificate of Discharge. I am of opinion,

therefore, that the Registrar may receive this Certificate of Discharge for registration. He will, of course, enter in his Books by whom the Discharge has been granted and it will be for the persons searching the title to satisfy themselves as to its sufficiency.

My opinon on such a question has not the force or effect of a decision.

Had the Mortgage been made to F. C. M. as Mortgagee, then a different question would have arisen; that is, the administrator of his administrator would not, I think, have been entitled to discharge such a mortgage, because such second administrator would not be administrator of the mortgagee.

CHARGES FOR ABSTRACTS; ORDERING ABSTRACTS AND SENDING BY MAIL INSTRUMENTS FOR REGISTRATION.

Certain disputes as to fees, between the Registrar of X. and Mr. T., Solicitor, have come before me for my decision.

1. The Registrar charged $1.70 for registering a Probate of a Will. The Solicitor concedes that if the Registrar is entitled to charge for copying the Affidavit of Verification annexed to the copy of the Probate, then the charge of $1.70 is correct. I think the Registrar is entitled to charge for copying the Affidavit of Verification, and I decide this dispute in favor of the Registrar.

2. Another question in difference is in regard to a charge of $1.00 made by the Registrar for an Abstract of Title. The Solicitor thinks this fee should only be 75 cents. The Abstract was of West 50 acres of South half Lot 22, Concession 10, and East 50 acres of South half Lot 21, Concession 10. These Lots were patented, and are of course entered separately in Abstract Index.

The Registrar states that in order to prepare this Abstract he necessarily had to refer to six instruments, although he found he would not have to enter more than three of these in the Abstract.

The proper fees are, I think, as follows:

Searches on 2 Lots	$0.50
Abstract, first folio	.25
Abstract, second folio	.15
2 References over 4	.10
	$1.00

I decide this dispute also in favor of the Registrar.

3. The Solicitor also asks whether the Registrar is entitled to a personal attendance, or is obliged to receive instruments and instructions by mail. The Solicitor observes that he can find nothing in reference to this matter in the Registry Act.

Searches and delivery of instruments are, I think, intended or presumed to be made personally, but there should be no objection to orders for Abstracts and instruments for registration being sent by letter if parties so desire, but of course at the risk of the sender as to transmission both to and from the Registry Office.

The use of the mails for registration purposes is universal and is of such general convenience it ought not to be discouraged. Of course the payment of the Registrar's fees must be arranged in some reasonable way.

It may be observed, however, that a Registrar is not allowed anything under the Act for writing letters or in connection with the return of instruments or the sending of Abstracts by mail. Registrars, however, usually do all this work, at some trouble to themselves, and also at some expense necessarily, for stationery, etc. I do not desire to say anything which will in the slightest degree tend to induce Registrars to discontinue such use of the mails.

At the same time, if a Solicitor becomes very strict in insisting on the letter of the law, in connection with his rights, as against a Registrar, he may possibly find the Registrar disposed to be equally strict in enforcing the letter of the law in regard to his rights, as against a Solicitor. I say this so as to discourage, both on the part of Solicitors and Registrars, anything like the insistence of strict compliance with what may be the letter of the law in the respect referred to.

4. Another matter afterwards laid before me by the Solicitor was in respect to a charge for an Abstract of Lot 6, E. Street. The Abstract contained over 100 words. The Registrar's charge, therefore, of 65 cents is correct, as follows:

Search	$0.25
Abstract, first folio	.25
Abstract, second folio	.15
In all	$0.65

I decide this matter accordingly.

There seems to be some question of disputed accounts between the Registrar and the Solicitor, into which, of course, I cannot enter.

Registration of Plan Subdividing Land into Lots. Land Subdivided Should be Definitely and Distinctly Described on Plan. Observations as to Title of Person Desiring to Register Plan.

Differences have been referred to me which have arisen between Mr. S., Solicitor for R., and the Registrar for the County of X., touching the registration of a Plan, known as the Plan of O. by P. H. R., subdividing what is described as part of the West third of the West half of Lot 6, Concession 16, Township of S.

The differences arise in this way. Mr. R., as owner of West one-third of West half of Lot 6 in the 16th Concession S., desires to register a Plan of subdivision of part of this West one-third of that Lot. The subdivision Lots on the Plan are laid out along the North shore of the N. River, and are intended for sites for summer cottages. They consist of some eight lots and a street and lane. The Registrar thinks that the Plan as tendered does not sufficiently comply with the Registry Act in respect to the description of the property to be subdivided and especially in not showing distinctly the position of the land, and he doubts whether Mr. R. appears by his Books to be the owner of the land.

Mr. R.'s registered title to the West third of Lot 6 appears to be founded upon two Tax Deeds granted by the County of X., one being a Deed dated 7th May, 1886, for the East 99 acres of the West half of Lot 6 (117½ acres), and the other Deed dated 26th December, 1891, for the West 18½ acres of the half lot. These two Deeds together cover 117½ acres, said to be the West half of the Lot.

Lot 6 in the 16th Concession was originally patented as containing 237 acres. Sales for taxes have been made by the County of portions of the East half and portions of the West half of Lot, and in the Deeds connected with these sales the East half is treated as containing 117½ acres and the West half is treated as containing 117½ acres. The lot is said to be irregular in shape.

Besides the sales for taxes of part of the West half above referred to, there appears to have been an earlier sale for taxes of part of the West half, one carried out by Deed from the County, dated 23rd September, 1874, for the West part of the West half, 85 acres.

Mr. R.'s Deed of the West one-third was made to him by J. and T., and I understand his Grantors acquired the titles of the Tax Purchasers under the Deeds of 1886 and 1891. They did not claim to derive title under Tax Deeds of 1874.

The Registrar says that he has heard it stated that there is a considerable overplus in the West half of Lot 6, that is, that the half lot contains more than 117½ acres; but there is nothing on record to show any such overplus. If there is such overplus he thinks that there should or would be a wedge or parcel of land lying between the West boundary of the 99 acres and the East boundary of the 18½ acres and, therefore, that Mr. R.'s title would not be complete to the West third of the land.

I am of opinion as follows:

1. For the purpose of registering the Plan I think the two Tax Deeds, one of 99 acres, and the other 18½ acres, under the circumstances, may be deemed together to cover and to have been intended to cover the West half Lot.

2. The Registrar considers that the Plan should give more information regarding the boundaries of Lot 6 or the parts of Lot 6 affected than the Plan gives. In so far as the Registrar desires to have the Plan show distinctly the position of

the land, I have to say that I partly agree with him; I think, on the whole, that the Plan which I have seen could and should be amended so as to show or describe more distinctly or fully the position of the land, than is now shown on the Plan; for instance, by giving a particular description by metes and bounds of the part of the West one-third of the West half proposed to be subdivided and also showing the area of that part.

The plan states that O. is on the West one-third of the West half of Lot 6.

The Solicitor states that there is a definite starting point for a description to show distinctly the position of the land affected by the Plan.

3. An amendment to the heading of the Plan can be made to the effect following:—The part of the said West one-third by this Plan subdivided consists of the part described as follows:—That is to say, commencing on the North Bank of the N. River at the boundary line between Lots 5 and 6, thence proceeding Easterly along the Northerly Bank of the River five chains and then describing the next course which runs almost due North, according to the Plan, along the East side of subdivision Lot 8, and East end of M. Street to the Northerly angle of M. Street, thence West to the division line between Lots 5 and 6 and thence South to the place of beginning, which said part of said West one-third of West half Lot contains by admeasurement acres. The Surveyor can give the courses and lengths of the several courses in the description after the first.

4. The words and figures now on the Plan indicating that the second line or boundary, according to foregoing description, is the East boundary of the West one-third may, if the parties desire, be eliminated.

I may add, in connection with registration of the Plan, that neither my opinion nor the Registrar's action will really affect the title. I think clause 16 of section 80 of the Registry Act was intended to prevent the registration of Plans by persons who had no apparent registered title to the lands affected by the Plan. A person may have an apparent title which may be bad even although it is registered. If and when the Plan is amended as above it is offered for registration I think the Registrar should register it. The Registrar is merely concerned under subsection 16 to see that according to his Books the person desiring to register a Plan apparently is the owner, that he has a sort of *prima facie* title. The fact of registration of the Plan will not confer any title. It will be for persons searching the title to any of the subdivision Lots or to any other part of the West one-third of the West half to satisfy themselves as to whether or not Mr. R.'s title is a valid one.

FORM OF CERTIFICATE OF DISCHARGE OF MORTGAGE SINCE FIRST SEPTEMBER, 1910. DIFFERENCES IN FORM, ETC., BETWEEN FORMER ACT AND PRESENT ACT.

A question has arisen at the instance of Mr. J., Solicitor X., as to whether a Certificate of Discharge of Mortgage addressed to "The Registrar of the County of ," instead of being addressed to "The Registrar of the Registry Division of the County of ," is properly so addressed; and a further question of precisely the same nature arises in connection with the statement in the body of the Discharge, that the Mortgage referred to was registered in "The Registry Office of the County of ," instead of calling it "The Registry Division of the County of ."

Both under the former and present Acts the Registry Offices were for what is known as Registry Divisions.

Under the former Act, however, Schedule "L" thereto, being the form of Certificate of Discharge of Mortgage provided that the Discharge should be addressed to "The Registrar of the County of ," and in the body of the discharge there was provision made for a statement that "The Mortgage was registered in the Registry Office for the County of ."

Under the new Act, the form 10, for a Discharge of Mortgage, provides for addressing the Certificate "To the Registrar of the Registry Division of ," and in the body of the Discharge the Registry Office is referred to as "The Registry Office for the Registry Division of ."

Section 62 of the new Act provides that in the case of a registered Mortgage the Registrar on receiving "a certificate, form 10, executed," etc.

There is nothing in the Act itself saying how far it is absolutely necessary to strictly follow these forms. The corresponding provision in the previous Act, section 76, provided for a form of Discharge, Schedule "L" or to the *like effect.* The words *"to the like effect"* are left out of the present Act.

By The Interpretation Act, 7 Edward VII., chapter 2, section 7, subsection 35, it is provided that where forms are prescribed deviations therefrom not affecting the substance or calculated to mislead shall not vitiate them.

I am of opinion that the deviation from form 10 does not affect the substance and is not calculated to mislead, and, therefore, I think the Discharge now in question is a valid Discharge of the Mortgage and may properly be registered.

At the same time, I think the Registrar is right in calling the attention of members of the profession to the change in the language of the form, and, as far as possible, it is better to have the form more strictly followed.

CHARGES FOR REGISTRATION OF A DEED IN SIX DIFFERENT MUNICIPALITIES IN ONE COUNTY. SHOULD NOT INCLUDE EXTRA CHARGE FOR CERTIFICATE IN CONNECTION WITH FIVE REGISTRATIONS.

A difference has been referred to me in respect to fees, which has arisen between Mr. H., Solicitor, B., and the Registrar of the County of X.

Mr. H. sent a deed for registration containing 17 folios, and in addition there were three affidavits. The Deed affected lands in six different Municipalities in the County of X.

The Registrar's charge is $16.35. Mr. H. thinks this is too much.

I have not seen the affidavits, but from the statements as to their length I have assumed that they would contain about 130 to 140 words each.

I think I should allow for the first registration, say 21 fols. $3.15; and for the five additional registrations $10.50; in all $13.65.

His fees were made, the Registrar informs me, by his Clerk, and the latter included or charged for Certificates in connection with the five additional registrations. The Registrar admits that the charge for these Certificates, in view of the paragraph of the Registry Act immediately preceding clause 8 of section 91, is not right; and the Registrar states that it is not his practice to charge for certificates in such cases.

My opinion is that the proper fee for the registration of this Deed is $13.65.

THE OWNER OF THE SOIL OF A STREET LAID OUT ON A PLAN MAY MAKE A CONVEYANCE OF HIS RIGHT TO THE STREET. THE REGISTRAR IS NOT CONCERNED AS TO THE EFFECT OR OPERATION OF SUCH A CONVEYANCE.

A matter has been submitted to me for my ruling by Mr. O., Barrister, T., with respect to a difference of opinion between himself and the Registrar of P. touching the registration of a Deed affecting a Street or Avenue laid out on a Plan.

Mr. O. states that the Deed comprised a strip of land designated as an Avenue on a registered Plan of Lots in the Township of H., and the Registrar thinks that he should not permit the Deed to be registered, as it purports to deal with a Street or highway. The plan affects some lands on the shore of P. Lake, and was made with the view of effecting a sale of the Lots fronting on the Lake for summer cottages. Two sales have been made and Deeds registered of the Lots, one fronting on T. Avenue and the other on the Lake.

Mr. O. states that the Avenue has not been opened or used in any way, and what was laid out in Lots is still practically in a state of nature. Mr. O. claims to have bought the title of the person who laid out the Lots, and he intends ultimately to close T. Avenue, with the consent of the two cottagers. Mr. O.'s view is that the owner is at perfect liberty to convey or sell T. Avenue, subject, of course, to any easement in favor of the cottagers. He refers to the case of *Re* Hamilton Terminal and Whipple, 14 Ontario Law Reports, 117. He cites that case as deciding that the applicant for a Judge's Order to close a private lane laid out on a Plan must show that he has acquired a title to the soil in the lane. He further says he thinks he is entitled to register the Deed for what it is worth.

I have received a statement of the Registrar's views. He considers that it would be improper to close up and convey T. Avenue without having first obtained the consent of the different owners of properties abutting thereon, and that a Judge's Order should be obtained together with such Consent. He considers that section 85 of the Registry Act supports his views.

I have not seen a copy of the Deed, nor do I understand exactly how the land constituting T. Avenue has been described in it, but assuming that it is a Deed of Lots according to the Plan, and also of T. Avenue,

I am of opinion as follows:

The owner of the soil of T. Avenue has a right to make a conveyance of his right to the soil. What the effect or operation of that conveyance may be is another question. I do not think, however, it is a matter with which the Registrar is concerned. The registration of a Deed conveying what is known as T. Avenue would not close the Street, nor would it affect the rights of any parties, not parties to the Deed.

A Registrar, as Registrar, is not concerned with the question as to whether the Grantor of a parcel of land has or has not a right to make a grant of it.

I think, therefore, that the Deed should be registered for what it is worth.

OPINIONS BY DONALD GUTHRIE, K.C., INSPECTOR OF REGISTRY OFFICES.

REQUIREMENTS IN AN AFFIDAVIT TO PROCURE REGISTRATION OF AN INSTRUMENT WHICH DOES NOT CONFORM TO PLAN. SUGGESTIONS AS TO OVERCOMING ANY DIFFICULTY BY STATUTORY DECLARATION. DESCRIPTION BY REFERENCE TO A REGISTERED INSTRUMENT. INFORMATION AS TO LIMITS OF A PROPERTY SHOULD BE GIVEN BY CERTIFIED COPY OF OR EXTRACTS FROM PLANS, ETC.

To a Registrar:

Re G. and M.

I have your letter. I return the Instrument therein referred to, the documents thereto attached and the letter of C. Co.

I agree with you in thinking that the affidavit of Mr. L. does not seem to meet the requirements of section 108 of The Registry Act. It does not properly describe the lots, and gives no reason showing why it is impossible or inconvenient to obtain a new instrument or re-execution of this instrument.

You may suggest to the Solicitors that they may under sec. 1 of cap. 16 of 62 Victoria furnish a Statutory Declaration giving a local description of the lands affected by the instrument. Then, of course, the instrument may properly be registered.

While I think it would be better in case such a Statutory Declaration is furnished, to describe the lands in it in such a way as that from the description itself a surveyor might be enabled to trace or ascertain the lands affected; still, I am not prepared to say that a description, in aid of the description contained in this instrument, by correct reference to a registered instrument, and giving its number, for the particular Municipality would be an insufficient description, as a surveyor could in that case by search ascertain what would, I suppose, be a proper description.

Where a description in an instrument is in itself imperfect, but is deemed to be sufficient by reason of a reference to some registered instrument, I reserve for future consideration the question, if it is submitted to me for my decision, whether the Registrar is or is not entitled to a fee for search or searches by reason of being compelled to search the instrument to which it becomes necessary for him to refer, in order to ascertain the proper or full description.

I notice that the Solicitors, in their letter to you, ask you "Where is the Eastern limit of the C. estate," and they ask whether it is the centre line of the Street called F. Street on Plan 251. I doubt whether it is proper for you to answer such questions. If you did so you might in effect be giving an opinion with regard to the title, which, of course, you have no authority to do. You can give a certified copy of or extract from any instrument or plan which appears to show the limit of the C. estate or what is the centre line of F. Street, and then it will be for the Solicitors to determine for themselves where is the Eastern limit of the C. estate, etc.

A Statutory Certificate of Discharge of Mortgage may be validly signed by the Executors of the Executor of a Deceased Mortgagee.

To a Registrar:

In answer to the question submitted by you to me I have to say that I am of opinion that the Executors of the Will of A. B. H., deceased, who was the sole surviving Executrix of the Will of the Mortgagee, are the persons entitled by law to receive the mortgage money; and, therefore, I think they may by statutory certificate discharge the mortgage, as they purport to have done. I assume, of course, that the statements in the discharge are correct. You will, however, in entering this discharge in your abstract index, show the capacity in which the parties who sign the certificate of discharge profess to act in so doing.

REGISTRATION OF JUDGE'S ORDER DECLARING BRIDGE TO BE A COUNTY BRIDGE.

To a Registrar:

I have your letter regarding the registration of an Order of the County Court Judge for the maintenance, etc., of the Bridge on the B. Road in the Township of K.

Section 617 (a) of The Municipal Act, under which this Order is sought to be registered, provides that the Judge's Order shall be registered in the Registry Office for the Registry Division in which the Township is situated, and that from and after the date of such registration the bridge shall be a County bridge.

I think this clause does not contemplate registration of the Judge's Order as necessary to affect any particular Lot of land. Registration seems to be required as a matter of convenience, so that the Order may be on public record and thus be preserved, and be available for reference as to its contents.

I am of opinion, therefore, that if you register the Order in the Book for the Township concerned, that is the Book in which you copy instruments, you do all that is necessary to carry out the provisions of the Municipal Act in respect of the registration of this Order.

APPLICATION BY SOLICITOR FOR *ex parte* OPINION ON QUESTION OF DISPUTED FEES —REFUSED.

To a Solicitor:

I have your letter and I note what you say. I appreciate the circumstances as pointed out by you, but my position in these matters is a judicial one. I do not give, even to Registrars, *ex parte* opinions on questions of disputed fees; unless, indeed, on their own statement of facts, my opinion is adverse to them. I find that it is of advantage, aside from all questions of propriety, for me to hear both sides before giving my opinion in such matters.

Then, again, consider this: that to be of any value to you my opinion would have to be stated by you to the Registrar concerned, and he would have just cause for complaint, if I gave such an opinion without having afforded him an opportunity to present his side of the case. See Section 119 of the Registry Act.

INSTRUMENT PURPORTING TO BE A CERTIFICATE OF DISCHARGE OF MORTGAGE EXECUTED BEFORE NOTARY IN QUEBEC. DEFECTIVE UNDER REGISTRY ACT. SUGGESTIONS.

To a Registrar:

Re P.

The circumstances of the case in respect of which you ask my opinion are, I understand from you, as follows:—

A notarial copy of an instrument called a "final Acquitance of Mortgage" executed in the Province of Quebec, has been presented to you for registration. The notarial copy is sufficiently authenticated by a Notary of that Province to be entitled to registration under section 58 of the Registry Act, provided the instrument in other respects complies with the Registry Act, in respect to Statutory Discharges of Mortgages.

This instrument described the Mortgage of which it purports to acknowledge payment as having been registered in your Registry Office, "as number 4,948." It does not state to what Municipality this Number applies. It describes the Mortgagee who purports to have executed the Discharge before the Notary Public, the Mortgagee being a resident of St. A., in the Province of Quebec. It does not, however, describe the Mortgagor other than by name.

I am of opinion as follows:—

1. The instrument does not sufficiently comply with the provisions of section 76 of The Registry Act, touching the contents of a Statutory Certificate of Discharge of Mortgage, in at least the following particulars:

(a) It does not sufficiently describe the Mortgagor.

(b) It does not give the date of registration, nor indeed any particulars regarding that Act, except the registration number, but it does not say for what Municipality.

(c) It does not state that the Mortgage has not been assigned, nor does it state that the person who purports to have executed the instrument before the Notary, was the person entitled by law to receive the Mortgage money. Had there been a statement that the Mortgage had not been assigned the last mentioned fact might have been inferred.

2. I may suggest to you that you may call the attention of the party who desires to register this Instrument to the Act to amend the Registry Act, 1899, 62 Vic., cap. 16, sec. 1, I think, treating the instrument as one affecting lands without local description, the instrument may be registered, if it has attached to it a Statutory Declaration under that Act made by one of the parties to the instrument, to the effect that the instrument affects lands within your County, and giving a local or general description of such lands sufficient to enable the same to be traced or ascertained by a surveyor.

3. For the purpose of making such a Declaration, I think, you may treat the Mortgagor as a party to the instrument.

4. Should the parties concerned adopt my suggestion, then in entering the instrument in your Abstract Index you had better in the Column for Remarks say "See Instrument."

CONVEYANCE DESCRIBING ALL THE LOTS ON REGISTERED PLANS BY ORIGINAL METES AND BOUNDS, EXCEPTING CERTAIN SPECIFIED LOTS SOLD IS OBJECTIONABLE. INSTRUMENT ENTERED ON TOWNSHIP LOTS ONLY. DIRECTION TO ENTER SAME ON ALL SUBDIVISION LOTS AFFECTED. INSTRUCTIONS.

To a Deputy Registrar:

Re X. Park.

I am to-day in receipt of your letter of 20th instant, enclosing Deed No. 13,498 for Y. Township, dated 15th June, 1909, which I now return. The instrument describes the lands as Composed of parts of certain lots and sub-divisions on registered plans of X. Park. It purports to grant certain lots and sub-divisions according to plans of X. Park filed in your office, thus: All and Singular that certain parcel of land situated in the Township of Y known as "the X. Park Summer Resort," plans of which are registered, "being composed of part of lots Nos. 22 and 23 in the Third Concession," and after describing the lands by metes and bounds it says, "Save and except the following blocks and lots of land in the said Park according to said Plans, which have been sold, namely, lots one," and giving further numbers up to some sixty lots or more in ten or more different blocks and also the whole of Blocks L. and M.

I understand from you that the Instrument referred to was registered before you became Deputy Registrar. It was entered in the Abstract Index for the Township on lots Nos. 22 and 23 in the Third Concession; it was not entered in the Index on any of the separate sub-division blocks or lots granted or affected by the instrument as laid down on the registered Plans of X. Park, and the question on which you ask my opinion is, should the instrument be entered on each separate lot affected by it according to the Registered Plans of X. Park?

I am of opinion that under sub-section 3 of section 100 of the Registry Act, this Instrument should be entered on all the lots and sub-divisions laid down according to the Registered Plans of X. Park, except those blocks and lots expressly stated in the Deed to be excepted.

I think this should be done under sub-section 2 of section 94 of the Registry Act. You will therefore cause these entries to be made, and you will make a memorandum stating the date of every such entry in red ink in the margin of the index opposite or near thereto in respect of each sub-division lot or block affected, and each such memorandum has to be signed by the Registrar or by yourself as Deputy; in other words you will conform to the provisions of section 94.

I consider that such a description as is given in this Deed is objectionable, because, for one thing, it casts duties on the Registrar which he may not be bound to perform; at least without being entitled to extra fees.

INSPECTOR OF PRISONS & ASYLUMS, BEING A CORPORATION, AFFIXED HIS CORPORATE SEAL AND SIGNATURE TO A CONVEYANCE OF A LUNATIC'S ESTATE SUFFICIENT FOR REGISTRATION PURPOSES WITHOUT AN AFFIDAVIT.

To a Registrar:

The question submitted by you for my opinion is as follows:—

A Conveyance has been presented to you for registration purporting to be made by J. C., now an inmate of the Asylum for the Insane at Mimico, acting by his Statutory Committee, the Inspector of Asylums and Prisons for Ontario, of the First Part, the Inspector, of the Second Part, and the Grantee or Purchaser of the Third Part.

The Conveyance recites the title of the lunatic to the lands conveyed, that he has no guardian or committee other than the Inspector; that the Inspector in the exercise of his powers and duties under the Revised Statutes respecting Lunatic Asylums, in order to secure the payment of the maintenance of the lunatic in the Asylum and considering it in the interests of the said lunatic so to do, did, subject to the concurrence of the Honourable the Attorney-General agree with the Grantee to convey to him all the estate of the lunatic in the lands in consideration of $1,300.00. The conveyance proceeds accordingly to carry out the above recitals.

It purports to be executed as follows: J. C., by his Statutory Committee, Inspector of Prisons and Public Charities. It contains an ordinary seal opposite C,'s name and the Official Seal of the Inspector of Prisons and Public Charities for Ontario, and is further signed again by the Inspector. In the margin the Attorney-General has signed a memorandum showing his concurrence in the sale.

The question you ask my opinion on is should this Instrument have an affidavit of execution before it can be registered?

In answer I have to say that, on the whole, I think the Instrument does not require an affidavit of its execution by the Inspector of Prisons and Public Charities.

By section 6 of Chapter 321 R. S. O., being The Prisons and Asylums Inspection Act, it is enacted that for the purposes of chapter 308 to chapter 320 of the Revised Statutes, the Inspector for the time being, whose commission bears the earlier date, shall be a Corporation sole by the name of the Inspector of Prisons and Public Charities, and by that name he and his successors in Office shall have perpetual succession etc.

Then under chapter 317 section 48, the Inspector, amongst other powers, has power to sell the real estate of a lunatic as fully and as effectually to all intents and purposes as the lunatic could do, if of sound mind, the sale, however, not to take place without the concurrence of the Attorney-General of Ontario.

I have never considered it necessary that the signature of the Attorney-General or other public Official, approving of a Conveyance, should be verified by affidavit.

Giving a liberal construction of section 51 of The Registry Act, and other provisions of law respecting such matters, and treating the Inspector as a Corporation sole, I think his Corporate Seal attested by his signature is without an affidavit sufficient evidence of the due execution of the Conveyance by the Corporation for all purposes respecting registration.

You may, in the column for remarks in the Abstract Index, say "Instrument executed under Corporate Seal of Inspector. See Instrument."

AN AFFIDAVIT OF EXECUTION OF AN INSTRUMENT MAY BE MADE BEFORE A COMMISSIONER FOR OATHS IN ENGLAND.

To a Barrister:

I have your letter of 2nd inst. I am of opinion that the Affidavit made in England before an Official who subscribes himself "a Commissioner for Oaths," is made before a person qualified to take affidavits under the present Registry Act.

I am sending a copy of this letter to the Registrar.

Discharge of a Registered Mortgage on Unpatented Lands.

To a Registrar:

I have your letter of yesterday.

I am of opinion that as the law allows the registration of a Mortgage against unpatented lands, the discharge of that Mortgage may be registered by you, provided, of course, it is in due form and the execution of it is duly proved.

I prefer to leave the general question you have asked me regarding Wills for future consideration. When any case of the kind presents itself to you you can then let me know the facts and I will endeavour to advise you.

FORM OF CERTIFICATE OF REGISTRATION UNDER NEW REGISTRY ACT. MORTGAGES "NOT TO BE RECORDED IN FULL." SIGNATURE TO THESE WORDS NOT REQUIRED. NOTICE OF EXERCISING POWER OF SALE NOT REQUIRED NOW TO BE REGISTERED PRELIMINARY TO REGISTRATION OF CONVEYANCE. INSTRUMENTS PURPORTING TO BE EXECUTED UNDER SEAL, BUT WHICH ARE NOT IN FACT SEALED.

To a Registrar:

I have your letter of yesterday's date.

1. As the new Registry Act provides the form (8) of a Certificate of Registration, I think it should be followed. Your office will be designated Registry Office "of the Registry Division of the County of X." I do not intend, however, to imply that if the words "Registry Division" are left out the Certificate would be defective.

2. I think the words "Not to be recorded in full" endorsed on the back of Mortgages do not require to be *signed* under the new Act.

3. I agree with you in thinking that it is not compulsory now to register Notice of Exercising Power of Sale as a condition precedent to the registration of a Conveyance made in pursuance of such Notice.

4. With regard to section 50 of the new Registry Act, and the question you raise as to the case of the absence of seals from an instrument which purports to be under seal, I think it is proper that you should in your Certificate of Registration state that although the instrument purports to have been executed under seal it does not appear to be under seal. That will be according to the actual fact. An instrument intended to be an instrument under seal, as for instance a Conveyance of land, may, if unsealed, take effect as an Agreement or evidence of a sale or of an actual transaction or in some other way. I do not, therefore, consider that the Registrar should reject it because it is not apparently sealed. Besides, it may be that it was sealed when executed and the seals have come off. It is proper, however, that attention should be called to the want of seals if the instrument purports to have been executed under seal.

FORM OF AFFIDAVIT OF EXECUTION OF AN INSTRUMENT UNDER NEW REGISTRY ACT. SEAL OF SURROGATE COURT TO THE CERTIFICATE OF THE REGISTRAR OF THAT COURT UNDER SECTION 56, SUBSECTION 4, NEW REGISTRY LAW NOT REQUIRED.

To a Registrar:

In answer to your letter of 19th inst., I have to say as follows:—

I should decidedly advise solicitors and others in preparing affidavits of execution of instruments to follow the form 5 contained in the New Registry Act. You will notice there is some difference between the present form "5" and the former form "G" in clauses 2 and 3. Clause 2 now requires after the word "executed" that the words, "by the said party" be added. Clause 3 requires that the witness should state that he knows the party who executed the instrument. These differences between the present and former forms of affidavits are emphasized by comparing sec. 35 of the New Act with sec. 40 of the Old Act. It is your duty to see that the provisions of the New Act in regard to affidavits of execution are substantially complied with.

In answer to the other question you ask, I have to say it does not appear to me that subsec. 4 of sec. 56 of the new Registry Act requires that the Certificate of the Registrar of the Surrogate Court shall be under the seal of the Surrogate Court.

CERTIFICATE OF DISCHARGE OF MORTGAGE BY ASSIGNEES OF EXECUTORS OF MORTGAGEE WHERE ASSIGNMENT BY EXECUTORS EXECUTED 17TH APRIL, 1889. PROBATE OF THE MORTGAGEE'S WILL NEED NOT BE REGISTERED.

To a Solicitor:

Re M. Mortgage.

I return the Assignment of Mortgage by you as executor of M., to A. I notice this Assignment is dated 27th February, 1886, and was registered in the Registry Office for the County of X., 1st March, 1886, that being the proper Registry Office.

I also return to you the Discharge of this Mortgage executed by B. It appears that the Mortgage was assigned by A. to B. 17th April, 1889, and this assignment was registered 4th March, 1899.

I am of opinion that this Discharge may be registered without first registering the Probate of the Will of the Mortgagee M. Mr. A.'s title, as the law then stood to the Mortgage money and to give a Discharge of the Mortgage, was complete without registration of the Will of M., and therefore A.'s assignee is, in my opinion, entitled to receive the Mortgage money and discharge the mortgage without requiring the registration of the Probate of the Will of M.

WHERE AN INSTRUMENT IS A CONVEYANCE OF THE FREEHOLD AND AN ASSIGNMENT OF THE MORTGAGE IT MAY BE REGISTERED AS ONE INSTRUMENT AND REGISTRAR NOT ENTITLED TO DOUBLE FEES.

To a Solicitor:

The case submitted by you for my opinion is as follows:—

"A short time ago I registered a Conveyance and Assignment of Mortgage, the particulars of which are as follows:—The land was owned by the husband of the Grantee but was subject to a Mortgage in favor of the father of the Grantee. By one conveyance I had the husband convey the freehold and the father assign the Mortgage, the whole conveyance not exceeding say 700 words. The Registrar thinks he is entitled to charge for two separate instruments, an Assignment of Mortgage and also a Conveyance; I contend that his fee should be simply for registering one Conveyance. Please inform me whether the fee should be double on account of the double nature of the Conveyance."

I am of opinion that the instrument does not for the purposes of the Registry Act constitute two separate instruments, and that there should not be a double fee for registration on account of the double nature of the conveyance. I had occasion to consider, some years ago, a somewhat similar question where by virtue of a partition Deed different parcels of land were conveyed to five or six different Grantees, and after consideration I then decided that, although in its operation and effect the instrument was equivalent to five or six separate conveyances, yet in determining the registration fees it had to be treated as one instrument.

REGISTRATION OF JOINT PLAN OF LANDS OF SEVERAL SEPARATE OWNERS SHOULD SHOW WHAT LANDS AFFECTED BY THE PLAN EACH OWNER CLAIMS TO OWN. OBSERVATIONS AS TO ENTRIES TO BE MADE IN CONNECTION WITH REGISTRATION OF PLAN.

To a Registrar:

In answer to your letter with regard to matters arising in connection with the registration of plans subdividing Lots, I have to say that I concur with you in thinking that you have a right to require, where a plan is signed by several persons purporting to be owners, and where they are not joint owners, some explicit statement showing what land affected by the Plan each claims to own, and so also with regard to Mortgagees who sign for the purpose of consenting to the registration of the Plan.

When plans are duly registered they should, of course, be entered in the Abstract Index against the lands affected by the subdivision, and also against each subdivision Lot.

The substance of your entry should be the fact that there is a plan, giving its date, its registration number and date of registration, and state by whom registered, and where a Mortgagee consents, add some such words as "A. B. consenting as Mortgagee." There is really no Grantor and Grantee in connection with the mere registration of a plan. Parties searching the title will have to satisfy themselves as to the title of the person who registers the plan and as to whether or not there are encumbrances affecting the subdivision Lots. The fact that you accept the Plan does not show that the title of the person who registers the plan is good, nor does it warrant anyone taking it for granted that there are no encumbrances, or, indeed, anything whatever as to the title.

There is no objection to your entering more than one subdivision Lot on one page of the Abstract Index, as long as you allow a reasonable space for each Lot and enter each Lot under a separate and distinct head.

WHERE A WILL AFFECTS BOTH PATENTED AND UNPATENTED LANDS—COURSE TO BE PURSUED.

To a Registrar:

I understand the case stated for my opinion by you is as follows:—A Will is tendered for registration in which the Testator bequeaths all his real estate to his two sons, describing the real estate as the East half of Lots 21 and 20 in the 5th Concession and the East half of Lot 25 in the 6th Concession of the Township of K. You state that there has been a patent issued for the East half of Lot 20 in Concession 5, but not for the other lands mentioned.

By section 34, subsection 7, of the Registry Act, it is enacted that excepting Mortgages, etc., given by the original nominee of the Crown, etc., no instrument affecting unpatented land shall be registered. This will, therefore, cannot in my opinion, be entered against the unpatented lots, and your certificate of registration must be limited accordingly.

By way of suggestion I may intimate that the solicitors can perhaps accomplish their purpose by giving sufficient notice of the fact of the Will to the Department of Lands, etc., in Toronto, if they so desire.

I do not think the Will can be put into the General Register by you unless the solicitor requests it to be registered there as well as in the separate Register, or unless it affects lands in your County without local description, which I understand it does not do.

AFFIDAVITS OR STATUTORY DECLARATIONS ALLEGING THAT LANDS IN WILLS HAVE BEEN ERRONEOUSLY DESCRIBED, OR STATING THAT A TESTATOR DID NOT OWN A CERTAIN LOT, OR PROFESSING TO SAY WHAT THE TESTATOR'S REAL INTENTION WAS CANNOT BE REGISTERED—SUGGESTIONS.

To a Registrar:

Re X. Probate.

In answer to your letter I have to say that, giving a liberal interpretation to section 34, I think under subsection 2 if a proper Statutory Declaration, in form 15, is furnished you may register it. The instrument is without proper local description touching one Lot.

I have many times refused to permit the registration of a Statutory Declaration as you have sent me a form of, Form 15 must be followed and there must be no reference to the erroneous description. There is absolutely no authority for recording any Declaration which professes to say that the Testator did not own a certain Lot, nor to say what his real intention was.

I have many times refused to permit the registration of a Statutory Declaration affecting titles to lands except in cases where the law expressly permits it. Here there is no permission. There is no provision for giving explanations by any person making an affidavit or a Statutory Declaration to explain errors in documents and have them registered under the Registry Act.

Kindly see, therefore, that form 15 is complied with if any other Statutory Declaration is presented to you. Nothing should be contained therein except what form 15 permits.

REGISTRATION OF WILL CONTAINING SUFFICIENT AND INSUFFICIENT DESCRIPTIONS OF LANDS—COURSE TO BE PURSUED—SUGGESTIONS.

To a Registrar:

Re K.

I have your letter of 29th inst.

I return the copy Will.

I think the first devise can hardly be deemed to be sufficient for the purpose of registering the Will against Lot 14, Concession "A," and broken front, etc., of W. It comes near the line however.

I think the description of the Lot, known as the "R. Lot," unless it is so marked and designated on the plan of P., is not a sufficient local description.

I think the devise of part of Lot 14, Concession "A" and broken front, and marsh lying South of the front road, known as the "D. Farm" is not a sufficient local description.

On the whole the better way to treat the Probate will be to register it both in the General Register and in the local Registers, so far as the descriptions are sufficient.

No Declaration is required under subsections 1 and 6 of section 34 before the Will can be recorded in the General Register.

I think when the Will is once registered in the General Register, it can be registered upon particular parcels from time to time by Statutory Declaration, giving proper local descriptions.

APPENDIX

FEES AND EMOLUMENTS received by the Registrars of Deeds for the Province of Ontario for which are contrasted the amount of Fees, Surplus to Municipalities

SCHEDULE A.

No. of Registration Division.	Name of Registration Division.	Name of Registrar.	No. of Municipalities.	Total No. of instruments registered in 1909.	Instruments registered in 1910.			
					Total number.	Fees therefor.	Uncopied.	Copied but uncompared.
			1	1a	2	3	4	5
						$ c.		
1	Algoma	C. F. Farewell	12	2,332	2,931	3,623 85	.....	.....
2	Brant	A. Graham	7	3,042	3,092	3,571 55	16	.....
3	Bruce	Walter M. Dack	28	3,943	3,593	4,188 10	.....	.....
4	Carleton	P. J. Coffey	11	2,673	2,938	3,814 47	14	.....
5	Dufferin	D. J. Hunter	9	1,419	1,318	1,517 95	.....	.....
6	Dundas	R. Johnston Dillon	8	1,502	1,101	1,269 40	4	.....
7	Durham, East	Henry Elliott	5	741	876	1,158 70	57	.....
8	Durham, West	S. Pollard	5	590	878	1,126 35	241	.....
9	Elgin	James H. Coyne	12	3,955	3,959	4,710 65	.....	.....
10	Essex	J. Wallace Askin	23	4,866	5,126	5,854 70	11	.....
11	Frontenac	J. Duncan Thompson	.....	.....	195	233 90	.....	.....
		E. Blake Thompson	.....	.....	296	339 95	.....	.....
		John Gibson	18	1,392	774	968 00	.....	.....
12	Glengarry	John Simpson	8	1,123	1,119	1,303 80	.....	.....
13	Grenville	John Hollingsworth	9	950	962	1,376 75	.....	.....
14	Grey, North R.	R. McKnight	13	2,856	2,844	3,190 75	6	.....
15	Grey, South R.	Thos. Lauder	11	1,949	1,819	2,119 90	.....	.....
16	Haldimand	J. Baxter	14	1,472	1,556	1,906 10	.....	.....
17	Haliburton	E. C. Young	10	306	331	458 45	.....	.....
18	Halton	D. Robertson	9	1,468	1,746	2,020 73	.....	.....
19	Hastings	S. Russell	32	3,070	3,221	3,850 60	96	.....
20	Huron	William Coats	25	3,736	3,672	4,081 50	39	.....
21	Kingston, City	J. P. Gildersleeve	.....	1,104	943	1,121 40	30	.....
22	Kent	P. D. McKellar	20	4,931	4,912	5,419 65	55	.....
23	Kenora	R. E. Preston	.....	263	279	284 50	.....	.....
24	Lambton	A. McLean	21	3,828	3,620	4,017 75	17	.....
25	Lanark, North	P. C. McGregor	10	659	704	824 45	.....	.....
26	Lanark, South	James Armour	9	1,796	1,914	1,671 95	.....	.....
27	Leeds	Wilmot H. Cole	16	2,079	1,993	2,339 40	.....	.....
28	Lennox and Addington	Jas. Reid	17	1,260	1,325	1,570 28	.....	.....
29	Lincoln	Carl E. Fisher	14	2,307	2,979	3,759 02	581	.....
30	London, City	R. H. Dignan	.....	2,854	2,678	2,852 05	.....	.....
31	Manitoulin	W. R. Abrey	44	447	499	600 24	11	.....
32	Middlesex, North and East	John Waters (to Dec. 6th)	13	2,837	2,618	3,057 46	.....	.....
		L. A. Baynes (Deputy Reg. to Dec. 31st)	.....	.....	333	302 20	.....	.....
33	Middlesex, West	Stephen Blackburn	9	902	1,159	1,427 25	.....	.....
34	Muskoka	John E. Lount	27	1,304	1,099	1,336 80	56	.....
35	Norfolk	William E. Tisdale	13	2,478	2,481	3,669 85	.....	.....
36	Northumberland, East	Arthur G. Willioughy	9	1,433	1,951	2,284 35	.....	.....
37	Northumberland, West	F. W. Field	5	787	873	1,127 90	279	.....
38	Nipissing	J. M. Deacon	15	1,296	1,395	1,535 75	.....	.....
		J. M. Deacon, approximately	.....	.....	1,174	1,312 45	.....	.....
39	Ontario	Geo. W. Dryden	17	2,164	2,681	3,300 35	95	117
40	Ottawa	Joseph G. Fisher	.....	6,089	7,335	8,625 60	484	.....
41	Oxford	George R. Pattullo	17	3,042	3,298	3,820 10	27	.....
42	Parry Sound	Thos. Kennedy	54	1,024	984	1,283 60	.....	.....
43	Peel	Robert Johnston	8	1,461	2,035	1,927 70	.....	.....
44	Perth, North	James Steele	9	2,352	2,356	2,633 50	119	35
45	Perth, South	Henry F. Sharp	7	1,036	983	1,163 45	13	5
46	Peterborough	Bernard Morrow	19	2,718	2,822	3,734 65	90	.....
47	Prescott	Fred. W. Thistlethwaite	10	1,560	1,691	2,067 10	110	.....
48	Prince Edward	Walter Mackenzie	10	1,077	1,010	1,439 10	.....	.....
49	Rainy River	Walter John Keating	11	.....	27	22 35	.....	.....
50	Renfrew	Robert A. Campbell	22	2,354	2,136	2,489 20	.....	.....
51	Russell	W. H. Lowrie	6	2,377	1,531	1,712 05	275	.....
52	Simcoe	Samuel Lount	22	5,761	5,612	6,669 63	.....	.....
53	Stormont	John C. Alquire	6	1,521	1,323	1,555 35	.....	.....
54	Sudbury	Stephen Fournier	23	197	527	641 13	.....	.....
55	Thunder Bay	Isabella Wilson (Deputy Registrar)	37	4,963	6,112	7,759 42	.....	.....
56	Toronto, East	Peter Ryan	.....	12,493	17,136	20,511 40	137	.....
57	Toronto, West	Robert H. Bowes	.....	16,239	21,494	24,883 90	188	.....
58	Victoria	Charles D. Barr	21	1,688	1,564	1,909 80	.....	.....
59	Waterloo	John D. Moore	13	4,391	4,243	4,995 50	190	.....
60	Welland	Judson C. Crow	15	3,924	4,113	5,231 52	1,644	.....
61	Wellington, North	John Anderson	11	1,306	1,350	1,521 70	30	15
62	Wellington South and Centre	Margaret A. Higinbotham (Deputy Registrar)	11	2,209	2,310	2,740 55	.....	.....
63	Wentworth	Robert Knight Hope	11	8,179	10,037	11,440 33	.....	.....
64	York, East and West	William J. Hill	14	7,549	6,852	9,020 60	183	10
65	York, North	David Lloyd	10	1,628	1,699	2,036 15	47	.....
		Totals	805	176,548	192,877	228,336 58	5,145	182

the year 1910, made in accordance with the provisions of R.S.O., 1897, cap. 136, sec. 124, with and Registrar's incomes for the years 1909 and 1908.

SCHEDULE A.

Patents.		Deeds.		Mortgages.		Dis. of Mortgages.		Wills.		Leases.		No. of Registration Division.
No. registered.	Fees for same.	No. registered.	Fees for same.	No registered.	Fees for same.	No. registered.	Fees for same.	No. registered.	Fees for same.	No. registered.	Fees for same.	
6	7	8	9	10	11	12	13	14	15	16	17	
	$ c.		$ c.		$ c.		$ c.		$ c.		$ c.	
14	22 25	1,283	1,951 15	595	674 60	585	321 20	41	78 00	4	10 00	1
....	.....	1,177	1,790 50	773	780 80	704	389 15	102	171 25	19	33 40	2
6	890 00	1,290	1,971 40	848	889 55	875	525 25	164	321 40	7	16 55	3
4	5 90	1,226	1,955 90	690	732 25	611	444 15	78	172 95	4	8 55	4
1	1 40	453	706 10	334	349 20	370	211 95	44	109 30	2	4 40	5
....	.....	366	536 90	265	280 10	279	147 50	58	115 70	7	11 45	6
....	.....	402	659 85	136	146 75	181	128 10	42	82 95	1	2 95	7
....	.....	428	670 35	118	118 55	182	117 40	44	78 95	3	7 90	8
....	.....	1,372	2,136 35	894	915 30	946	519 85	112	240 70	197	379 00	9
8	15 05	2,009	2,977 90	1,218	1,319 65	1,260	666 25	104	186 95	70	115 15	
....	.....	73	109 90	42	49 20	55	41 50	6	9 75	2	280 00	10
2	2 80	97	144 00	83	82 40	69	51 00	12	20 50	4	6 20	
4	6 80	251	396 55	166	182 75	190	140 20	43	77 15	28	49 70	11
....	.....	356	528 25	287	311 00	283	157 50	52	84 80	12	24 50	12
....	.....	371	613 25	200	213 25	228	133 15	64	117 60	6	10 20	13
3	5 10	1,157	1,534 08	684	710 00	750	344 25	79	149 55	12	17 30	14
1	1 40	676	1,034 65	393	423 05	484	268 45	79	157 75	7	12 95	15
....	.....	559	941 85	317	436 20	346	200 70	53	96 65	40	71 75	16
4	6 50	212	312 60	50	71 35	32	17 75	8	18 95	.....	.....	17
....	.....	715	1,096 55	447	466 40	357	225 50	79	144 60	4	6 10	18
13	19 95	1,239	1,891 80	628	664 15	725	403 50	129	217 75	14	27 95	19
1	1 40	1,202	1,812 05	834	856 95	1,016	590 25	221	361 15	5	9 15	20
1	1 40	344	538 30	248	254 60	234	183 05	32	52 65	3	7 55	21
2	2 80	1,604	2,408 35	1,055	918 15	1,259	664 85	120	187 19	211	319 85	22
....	.....	111	155 55	40	40 80	53	26 50	.....	.....	1	1 40	23
8	14 55	1,318	1,986 80	813	852 65	997	525 80	99	176 15	15	26 80	24
2	2 80	237	379 65	149	154 75	185	108 25	45	81 75	2	4 75	25
2	2 80	390	397 10	312	331 15	268	164 15	55	93 85	9	16 70	26
4	6 20	734	1,129 55	441	459 40	463	254 05	118	196 35	13	20 75	27
3	4 20	492	769 98	309	327 55	311	183 55	53	87 75	1	2 15	28
1	2 55	1,179	1,896 53	741	781 94	629	420 00	63	126 30	15	30 95	29
....	.....	878	1,323 50	685	687 95	723	383 45	87	162 30	5	10 35	30
....	.....	207	307 90	119	133 25	106	58 65	6	12 95	3	6 20	31
....	.....	931	1,551 45	616	618 00	652	348 11	113	193 85	4	8 75	
....	.....	67	103 65	57	59 30	54	30 10	7	11 45	1	1 40	32
....	.....	490	748 45	291	308 25	237	179 90	47	88 90	3	8 35	33
10	14 60	561	784 15	176	192 55	184	97 15	33	72 50	2	3 70	34
3	4 50	898	1,371 30	525	550 95	576	326 90	68	125 90	139	226 00	35
1	.....	745	1,143 75	368	389 65	419	294 30	55	104 10	4	5 85	36
1	1 55	354	632 15	129	133 10	216	136 25	35	73 65	4	8 75	37
....	.....	582	841 75	311	330 00	209	107 90	14	19 60	3	5 35	
....	.....	495	713 50	255	271 45	169	87 15	10	14 00	2	3 80	38
....	.....	1,113	1,723 30	514	540 75	610	361 40	119	256 40	5	11 75	39
16	17 10	2,901	4,707 10	2,077	2,078 25	1,668	912 45	119	198 70	2	5 40	40
....	.....	1,159	1,791 80	782	795 25	817	499 85	134	240 70	11	20 40	41
11	17 55	465	749 35	194	217 45	168	86 65	8	12 10	1	2 15	42
4	5 60	530	832 20	408	419 80	339	211 05	83	161 10	46	83 45	43
....	.....	783	1,193 70	561	571 40	588	323 95	79	136 15	2	4 25	44
....	.....	331	512 00	219	230 75	241	145 60	51	97 10	2	3 70	45
3	4 35	1,096	1,722 90	617	672 15	583	377 75	89	183 40	2	15 95	46
....	.....	495	786 95	406	443 10	408	228 10	54	139 45	136	192 80	47
1	1 70	399	598 05	197	206 20	245	136 50	63	88 10	3	4 20	48
....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49
1	1 40	858	1,318 95	475	497 15	514	277 75	64	126 45	4	8 60	50
....	.....	526	806 80	458	545 40	396	211 95	34	71 25	22	35 50	51
5	10 00	2,194	3,267 60	1,380	1,448 83	1,288	813 45	153	290 30	6	13 95	52
....	.....	416	623 10	335	400 30	365	200 80	71	160 05	2	3 10	53
...	.....	219	344 75	127	131 80	64	32 00	1	1 40	.....	.....	54
2	2 80	2,968	4,569 82	1,183	1,262 89	733	437 33	30	67 50	.....	.....	55
1	1 70	5,630	9,921 50	5,109	5,142 15	3,388	1,936 85	1	2 45	210	636 65	56
....	.....	7,039	11,363 10	7,077	7,116 10	3,833	2,151 00	426	836 30	23	63 15	57
2	2 80	537	862 10	360	381 35	413	260 30	63	135 75	2	3 40	58
1	1 55	1,674	2,708 55	1,033	1,029 10	1,004	586 30	144	269 95	8	18 20	59
....	.....	1,717	2,683 67	930	980 00	824	518 65	108	178 75	106	178 25	60
....	.....	427	656 45	297	311 75	392	245 10	84	149 00	3	6 40	61
....	.....	843	1,334 90	566	571 10	496	395 30	149	227 65	3	7 70	62
....	.....	3,395	5,340 87	2,764	2,806 17	2,393	1,367 20	245	418 45	23	69 65	63
....	.....	2,713	4,480 43	1,819	1,901 73	1,313	777 91	167	280 85	4	12 20	64
1	1 40	663	1,011 20	385	404 35	353	208 35	58	117 75	10	19 05	65
147	1,104 45	70,632	110,866 43	47,915	49,574 16	41,908	24,239 15	5,271	9,743 09	1,524	2,966 00	

Fees and Emoluments received by the Registrars

Schedule A.—*Continued.*

No. of Registration Division.	Name of Registrar.	Abstracts.		Searches.		Mechanic's Liens.		All other instruments.	
		Number.	Fees for same.	Number.	Fees for same.	Number.	Fees for same.	Number.	Fees for same.
		18	19	20	21	22	23	24	25
			$ c.		$ c.		$ c.		$ c.
1	C. F. Farewell	365	440 25	1,472	601 90	50	18 10	409	647 05
2	Alex. Graham	112	142 00	1,349	474 15	14	3 50	303	402 95
3	Walter M. Dack	911	788 85	1,031	256 55	8	2 00	395	452 05
4	P. J. Coffey	322	570 20	1,323	598 70	1	1 75	320	493 02
5	D. J. Hunter	211	298 55	386	156 40	1	25	113	135 35
6	R. Johnston Dillon	31	54 40	179	70 75	1	50	126	177 75
7	Henry Elliott	174	222 95	441	217 85	.....	.. ....	107	151 95
8	S. Pollard	195	357 00	353	198 24	.....	.....	103	133 20
9	James H. Coyne	114	237 05	2,256	640 65	11	2 85	427	516 60
10	J. Wallace Askin	113	155 35	2,701	1,166 85	8	2 00	449	571 75
11	J. Duncan Thompson	20	14 75	255	50 20	.....	.....	17	20 70
	E. Blake Thompson	19	20 15	384	81 60	.....	.....	29	33 05
	John Gibson (May 19th to Dec. 31st)	47	56 10	533	134 75	.....	.....	92	114 85
12	John Simpson	92	158 90	528	133 05	3	75	126	197 00
13	John Hollingsworth	37	58 60	294	92 60	1	25	92	116 75
14	R. McKnight	517	475 15	1,329	388 70	9	2 55	150	230 00
15	Thos. Lauder	461	377 80	497	124 25	2	50	177	221 15
16	Jacob Baxter	232	245 85	431	279 80	.....	.....	226	158 95
17	E. C. Young	89	74 30	259	64 80	.....	.....	25	31 30
18	D. Robertson	385	303 95	828	571 45	9	2 25	135	179 33
19	Samuel Russell	676	1,102 70	2,016	565 95	8	2 00	465	623 50
20	William Coats	784	652 40	1,182	350 10	7	2 00	386	448 55
21	J. P. Gildersleeve	31	47 20	622	264 65	5	1 25	76	82 60
22	P. D. McKellar	268	367 75	1,197	535 08	29	8 95	632	833 61
23	R. E. Preston	7	26 30	56	24 00	15	4 00	59	56 25
24	A. McLean	161	87 05	2,065	652 50	4	1 00	366	434 00
25	P. C. McGregor	146	110 45	367	108 55	.....	.....	84	92 50
26	James Armour	167	101 00	585	219 85	5	1 25	121	144 10
27	Wilmot H. Cole	114	158 40	1,283	333 95	5	1 50	215	271 60
28	Jas. Reid	49	72 15	669	184 60	.....	.....	107	122 95
29	Carl E. Fisher	855	1,368 90	1,295	646 55	8	2 55	343	498 20
30	R. H. Dignan	39	92 15	1,066	371 70	42	11 65	258	272 85
31	W. R. Abrey	42	46 15	522	129 05	.....	.....	58	81 29
32	John Waters (to Dec. 6th)	205	345 40	200	279 85	5	1 25	297	336 05
	L. A. Baynes (Deputy Reg., Dec. 7th to 31st)	13	15 35	109	47 90	.....	.....	25	31 95
33	Stephen Blackburn	209	272 35	378	138 65	1	25	1	50
34	John E. Lount	113	88 45	1,197	326 95	5	1 25	128	170 90
35	William E. Tisdale	165	222 35	1,775	501 45	4	1 00	268	306 35
36	Arthur G. Willoughby	520	610 30	263	118 90	7	2 50	280	344 20
37	F. W. Field	304	681 15	493	123 65	.....	.....	108	142 45
38	J. M. Deacon, approximately	155	181 45	990	233 05	37	17 00	239	214 15
		132	156 25	803	189 65	33	15 50	210	190 10
39	Geo. W. Dryden	311	584 80	869	346 20	6	1 50	314	405 25
40	Joseph G. Fisher	974	888 15	5,530	1,382 50	67	17 35	485	689 25
41	George R. Patullo	552	697 85	1,899	579 30	2	50	393	471 60
42	Thos. Kennedy	102	174 05	848	231 05	3	75	134	197 60
43	Robert Johnston	127	160 30	225	142 45	2	50	194	214 00
44	James Steele	318	337 55	1,081	300 20	4	1 10	339	402 95
45	Henry F. Sharp	160	138 65	490	122 50	1	50	256	218 75
46	Bernard Morrow	567	968 65	1,493	740 15	3	75	429	757 40
47	Fred. W. Thistlethwaite	124	157 55	414	199 70	.....	.....	192	276 70
48	Walter McKenzie	40	89 70	425	125 05	.....	.....	102	119 25
49	Walter John Keating	.....	.....	1	20	.....	.....	27	22 35
50	Robert A. Campbell	95	63 20	251	72 75	6	3 00	214	255 90
51	W. H. Lowrie	441	545 80	379	148 10	1	25	34	40 90
52	Samuel Lount	680	978 85	2,771	1,041 35	14	5 10	572	707 35
53	John C. Alquire	74	99 05	791	249 55	1	25	133	167 75
54	Stephen Fournier	124	83 15	218	114 92	18	4 50	98	126 68
55	Isabella Wilson (Deputy Registrar)	967	1,384 20	3,532	1,869 35	78	24 45	1,118	1,394 63
56	Peter Ryan	647	1,642 25	11,138	4,184 75	275	80 85	2,522	2,789 25
57	Robert Heber Bowes	456	993 90	17,072	6,487 80	286	72 45	2,810	3,281 80
58	Charles D. Barr	136	287 55	1,262	364 10	2	50	185	263 60
59	John D. Moore	196	227 40	635	325 55	27	6 75	352	374 90
60	Judson Crow	674	1,251 85	2,142	535 60	39	17 60	389	674 60
61	John Anderson	324	333 15	244	179 40	1	50	146	152 50
62	Margaret A. Higinbotham (Deputy Registrar)	110	198 40	1,810	528 15	7	1 75	246	292 15
63	Robert Knight Hope	2,040	3,949 75	4,586	1,946 05	76	30 55	1,141	1,407 44
64	William J. Hill	247	964 55	5,786	2,766 75	82	20 45	755	1,147 08
65	David Lloyd	117	156 15	496	220 40	7	1 85	222	272 20
	Totals	20,205	29,214 25	102,350	35,252 69	1,346	405 90	22,349	28,007 23

of Deeds for the Province of Ontario, etc.—*Continued.*

Schedule A.—*Continued.*

Received for work done for municipalities. 26	From other sources not enumerated. 27	Fees earned and not received. 28	Gross amount of fees earned for the year 1910. 29	Gross amount for 1909. 30	Gross amount for 1908. 30a	Amount paid Deputy Registrars for services. 31	Other charges in connection with office. 31a	No. of Registration Division.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
.....	.....	.....	4,764 55	3,789 27	2,813 55	605 00	439 09	1
.....	29 35	274 35	4,217 05	4,230 15	3,626 69	.....	1,405 00	2
.....	88 90	1,584 61	5,322 40	5,911 65	5,314 40	1,000 00	629 20	3
331 70	142 85	.....	5,126 22	4,450 75	4,474 60	1,084 00	522 32	4
.....	35 40	.....	2,008 30	2,095 85	2,339 95	800 00	135 30	5
.....	29 60	.....	1,424 15	1,556 05	1,521 20	300 00	.....	6
.....	.....	200 00	1,613 35	1,320 15	1,292 45	600 00	75 00	7
.....	29 80	618 03	1,711 39	1,061 82	962 42	420 00	44 60	8
1,943 09	141 20	4 95	5,730 15	5,403 80	5,352 67	945 95	785 52	9
.....	133 05	.....	7,309 95	6,696 55	6,295 00	1,352 00	965 10	10
.....	.....	2 30	298 85	363 85	.....	134 15	37 50	
.....	.....	.....	441 70	545 10	.....	.....	119 80	11
.....	79 55	25	1,238 40	2,165 95	2,227 05	.....	556 55	
.....	32 60	427 54	1,628 35	1,576 42	1,560 34	416 00	9 00	12
.....	21 10	72 90	1,376 75	1,393 20	1,340 75	720 00	120 00	13
.....	197 95	641 95	4,108 45	4,216 70	4,072 00	600 00	544 80	14
.....	60 95	406 17	2,682 90	2,876 45	2,652 05	900 00	638 81	15
.....	30 40	148 92	2,462 15	2,467 32	2,721 91	950 00	442 50	16
12 00	46 95	.....	644 50	552 63	469 85	20 00	....	17
.....	41 20	321 83	3,037 33	2,594 75	2,330 20	400 00	197 96	18
.....	115 70	631 46	5,634 95	5,164 90	5,038 25	1,350 00	741 91	19
100 00	.....	786 80	5,084 00	5,245 85	5,069 60	800 00	985 80	20
71 40	.....	.....	1,433 25	1,694 50	1,371 75	.....	275 10	21
.....	75 90	424 72	6,322 48	6,878 42	5,686 11	1,532 27	1,454 25	22
.....	.....	.....	332 10	290 40	354 60	100 00	11 00	23
22 00	.....	123 80	4,779 30	4,950 25	4,876 30	1,321 00	966 72	24
.....	242 40	2 80	1,066 85	1,002 15	996 09	47 63	.....	25
.....	.....	.....	1,671 95	1,529 80	1,460 35	200 00	.....	26
.....	79 25	75 00	2,911 00	3,012 12	2,845 65	780 00	500 00	27
.....	27 00	59 25	1,781 88	1,739 70	1,488 90	700 00	15 00	28
14 00	131 50	502 23	5,905 97	5,313 50	4,413 95	754 00	612 55	29
44 75	41 55	.....	3,402 20	3,660 65	3,693 00	520 00	57 00	30
.....	13 60	100 00	789 04	681 75	708 05	300 00	20 50	31
.....	5 50	.....	3,688 21	4,206 60	4,041 65	585 00	515 00	
.....	1 10	.....	302 20	.....	.....	36 00	.....	32
.....	.....	600 00	1,848 45	1,722 50	1,725 55	620 00	35 00	33
.....	83 40	.....	1,835 60	2,035 00	1,820 75	600 00	65 00	34
.....	33 15	18 35	3,669 85	3,595 05	3,178 05	778 00	603 00	35
.....	175 10	414 25	3,188 65	2,899 30	2,452 70	639 00	156 55	36
.....	20 40	603 91	1,953 10	1,835 15	1,525 40	540 00	148 00	37
.....	13 77	.....	1,964 02	1,630 95	1,935 35	677 00	.....	
.....	10 17	.....	1,651 57	.....	.....	537 00	.....	38
.....	109 50	.....	4,340 85	3,466 90	3,108 15	1,169 00	635 99	39
145 05	1,289 95	73 20	12,404 45	10,085 65	6,290 20	2,896 03	1,078 71	40
.....	96 25	.....	5,193 50	4,711 37	4,870 56	736 00	754 71	41
.....	168 90	101 40	1,857 60	1,746 00	1,765 45	469 50	247 56	42
50 00	16 40	32 45	2,246 85	2,150 65	2,059 80	700 00	200 00	43
.....	73 65	250 28	3,344 90	3,386 75	3,037 30	450 00	428 47	44
1,345 17	.....	.....	1,469 55	1,536 25	1,602 00	520 00	.....	45
.....	77 20	50 00	5,520 65	5,380 50	4,262 40	1,400 00	343 00	46
.....	260 95	.....	2,685 30	2,403 75	2,228 70	600 00	55 75	47
.....	70 45	.....	1,439 20	1,445 21	1,555 55	600 00	.....	48
.....	.....	3 00	22 55	.....	.....	.....	.....	49
.....	32 12	219 25	2,637 85	2,921 55	3,100 15	780 00	885 60	50
.....	.....	50 90	2,635 70	2,823 60	2,633 50	600 00	418 32	51
.....	112 80	.....	8,761 03	9,003 19	8,460 41	1,100 00	2,070 21	52
.....	38 35	40 90	1,942 30	2,269 55	2,031 60	383 00	84 82	53
.....	4 75	57 67	843 95	374 00	.....	430 00	.....	54
.....	369 35	.....	11,382 32	9,002 21	.....	920 00	3,955 30	55
.....	.....	.....	26,338 40	19,120 45	7,463 32	2,898 00	6,186 00	56
.....	.....	.....	32,365 60	25,906 55	13,526 50	3,470 00	9,280 00	57
.....	44 70	10 15	2,606 15	3,004 25	2,800 75	600 00	661 30	58
.....	26 65	888 90	5,574 90	5,776 20	4,783 60	500 00	1,104 62	59
.....	81 10	955 09	7,100 07	6,697 65	5,323 39	1,000 00	1,239 93	60
.....	44 70	300 00	2,078 95	1,977 90	2,192 45	600 00	190 00	61
.....	45 80	.....	3,512 90	3,203 00	2,850 95	520 00	819 70	62
.....	24 00	1,174 87	17,336 13	13,954 39	12,360 90	2,725 00	3,592 00	63
2,790 19	240 07	.....	12,592 02	12,630 42	9,289 42	1,560 00	4,008 50	64
.....	.....	63 55	2,412 70	2,343 65	2,141 85	500 00	300 00	65
6,869 35	5,437 98	13,317 98	299,009 88	271,682 54	216,791 03	52,793 53	53,370 02	

Fees and Emoluments received by the Registrars

Schedule A.—*Continued.*

No. of Registration Division.	Name of Registrar.	Surplus of gross income to municipality under sec. 126, cap. 136, R.S.O., 1897.				Surplus of net income to municipality under ss. 126 and 127, cap. 136, R.S.O., 1897.			
		Amount for 1910.	When paid.	Amount for 1909.	Amount for 1908.	Amount for 1910.	When paid.	Amount for 1909.	Amount for 1908.
		32	32a	33	33a	34	35	36	36a
		$ c.		$ c.	$ c.	$ c.		$ c.	$ c.
1	C. F. Farewell								
2	Alexander Graham	365 00	Jan. 13, 1911	369 00	188 00	139 40	Jan. 13, 1911	201 30	331 00
3	Walter M. Dack	778 97	Jan. 5, 1911	1,205 82	904 25	274 27	Jan. 5, 1911	299 10	259 65
4	Patrick J. Coffey	700 78	Jan. 14, 1911	435 22	489 84	245 82	Jan. 14, 1911	227 70	203 32
5	David J. Hunter								
6	R. Johnston Dillen								
7	Henry Elliott	11 30	Jan. 5, 1911						
8	Samuel Pollard								
9	James H. Coyne	940 14	Jan. 13, 1911	808 82	922 89	404 07	Jan. 13, 1911	372 12	312 02
10	J. Wallace Askin	1,573 98	Jan. 12, 1911	1,548 27	1,397 50	509 44	Jan. 12, 1911	295 68	248 77
11	J. Duncan Thompson								
	E. B. Thompson, D.R.					2 19	May 19, 1910		
	John Gibson, (May 9 to Dec. 31st.)								
12	John Simpson								
13	John Hollingsworth								
14	Robert McKnight	343 38	Jan. 6, 1911	367 36	328 80	137 42	Jan. 6, 1911	141 61	128 46
15	Thomas Lauder	18 29	Jan. 12, 1911	37 65	15 20				30 06
16	Jacob Baxter				22 19				
17	Ephraim C. Young								
18	D. Robertson	21 55	Jan. 6, 1911	8 40		69 20	Jan. 6, 1911	28 00	32 00
19	Samuel Russell	903 98	Jan. 14, 1911	715 96	769 13	191 72	Jan. 14, 1911	129 36	92 15
20	William Coates	683 60	Jan. 5, 1911	872 93	784 80	184 38	Jan. 5, 1911	173 30	162 84
21	James P. Gildersleeve								
22	Peter D. McKellar	1,178 99	Jan. 16, 1911	1,401 36	1,098 05	81 39	Jan. 16, 1911	125 73	23 49
23	Robert E. Preston								
24	A. McLean	561 72	Jan. 7, 1911	630 10	688 15	42 98	Jan. 7, 1911	37 60	46 03
25	Peter C. McGregor								
26	James Armour								
27	Wilmot H. Cole	41 10	Jan. 10, 1911	52 42	34 50	8 19	Jan. 10, 1911	17 65	3 30
28	James Reid								
29	Carl E. Fisher	1,062 39	Jan. 16, 1911	906 75	465 58	538 50	Jan. 16, 1911	398 17	239 36
30	Ralph H. Dignan	121 49	Jan. 14, 1911	182 94	193 56	197 68	Jan. 14, 1911	272 66	295 69
31	Warren R. Abrey								
32	John Walters to Dec. 6th L. A. Baynes (Dep. Reg. Dec. 7 to 31st.)	34 85	Jan. 3, 1911	214 25	182 90	34 85	Jan. 3, 1911		
33	Stephen Blackburn								
34	John E. Lount								
35	Wm. E. Tisdale	200 95	Jan. 10, 1911	178 51	88 03	67 58	Jan. 10, 1911	66 90	109 43
36	A. G. Willoughby					47 88	Jan. 9, 1911	36 79	8 64
37	F. W. Field								
38	J. M. Deacon, approximately								
39	George W. Dryden	402 25	Jan. 17, 1911	143 38	71 63	76 72	Jan. 17, 1911	33 54	7 03
40	Joseph P. Fisher	3,553 76	Jan. 13, 1911	2,640 88	1,395 10	1,165 45	Jan. 13, 1911	675 82	194 67
41	George R. Pattullo	727 40	Jan. 6, 1911	605 68	685 28	225 83	Jan. 6, 1911	152 02	17 88
42	Thomas Kennedy								
43	Robert Johnston								
44	James Steele	118 98	Jan. 14, 1911	127 35	25 02	119 49	Jan. 14, 1911	124 94	16 91
45	Henry F. Sharp								
46	Bernard Morrow	858 26		940 25	404 96	275 82		204 37	106 68
47	F. W. Thistlethwaite	18 53	Jan. 10, 1911			58 81	Jan. 10, 1911	17 67	
48	Walter Mackenzie								
49	W. J. Keating								
50	R. A. Campbell	13 78	Jan. 14, 1911	42 15	70 11	23 84	Jan. 14, 1911	45,84	65 13
51	W. H. Lowrie	13 57		32 00	0 73	11 73		31 00	50 77
52	Samuel Lount	2,154 41	Jan. 13, 1911	2,257 27	2,480 21	549 70	Jan. 13, 1911	625 07	280 73
53	John C. Alguire					8 66	Jan. 5, 1911	31 18	1 80
54	Stephen Fournier								
55	Isabella Wilson (Dep. Registrar)								
56	Peter Ryan					11,928 95		7,199 70	47330 95
57	Robert H. Bowes			3,145 80		14,054 05	Jan. 16, 1911	4,549 65	
58	Charles D. Barr	10 61	Jan. 14, 1911	50 85	30 07			8 13	
59	John D. Moore	879 96	Dec. 31, 1911	960 48	641 80	68 06	Dec. 31, 1910	146 71	68 49
60	Judson C. Crow	1,490 00	Jan. 23, 1911	1,599 00	1,411 70	485 00	Jan. 23, 1911	273 00	189 52
61	John Anderson								
62	Margaret A. Higinbotham (Dep. Reg.)	153 87	Jan. 16, 1911	90 60	35 09	53 86	Jan. 16, 1911	25 59	3 88
63	Robert K. Hope					6,316 77	Jan. 14, 1911	2,668 82	
64	William J. Hill	3,686 80	Jan. 11, 1911	3,702 40	23854 71	468 36	Jan. 11, 1911	259 50	160 05
65	David Lloyd					11 27	Jan. 6, 1911	6 86	5 68
	Totals	23,624 64		26,273 85	18,719 78	39,079 38		19,843 07	8,026 38

of Deeds for the Province of Ontario, etc.—*Continued.*

Schedule A.—*Concluded.*			Schedule B.							
Net amount received by Registrar.			Number and aggregate amount of mortgages registered.							
Amount for 1910.	Amount for 1909.	Amount for 1908.	For nominal consideration or amount not specified.	For $1,000 or under.	Over $1,000 and not exceeding $2,000.	Over $2,000 and not exceeding $5,000.	Over $5,000.	Total number.	Aggregate amount.	No. of Registration Division.
37	37a	37b	Class I. 38	Class II. 38	Class III. 38	Class IV. 38	Class V 38	39	40	
$ c.	$ c.	$ c.							$ c.	
3,720 44	2,728 72	1,735 70	9	396	111	60	19	595	769,728 58	1
2,307 60	2,469 70	2,347 19	3	351	232	150	37	773	12,418,145 50	2
2,639 96	2,697 88	2,596 62	12	435	193	192	16	846	1,228,130 56	3
2,905 30	2,531 31	2,474 44	6	381	159	415	29	690	965,383 12	4
1,073 00	1,174 85	1,323 55	11	119	95	100	9	335	612,053 26	5
1,124 15	1,256 05	1,421 20	.....	118	78	61	8	265	419,715 00	6
928 05	750 15	762 45	2	71	28	26	9	136	226,695 93	7
1,246 79	622 82	522 20	.....	53	33	29	3	118	199,912 66	8
2,804 87	2,772 12	2,712 02	7	446	251	156	32	894	3,972,115 26	9
2,909 43	2,689 93	2,580 48	6	619	339	214	40	1,218	1,720,846 57	10
127 70	1,336 95	1,457 85	.....	24	10	8	.....	42	51,897 98	11
319 71	.....	.....	.....	49	9	21	4	83	126,798 74	
681 85	.....	.....	.....	97	29	36	3	165	214,406 00	
1,203 35	1,336 95	1,457 85	.....	149	65	60	13	287	1,478,895 00	12
536 75	547 10	609 75	.....	121	45	32	2	200	256,392 81	13
2,473 15	2,607 70	2,472 24	27	293	218	138	8	684	1,038,784 18	14
1,125 80	1,265 62	950 63	5	192	114	74	8	393	573,217 01	15
1,069 65	1,071 82	1,317 72	.....	162	77	40	38	317	631,487 00	16
624 50	552 63	469 85	.....	47	3	.....	.....	50	3,086 00	17
2,026 80	1,979 54	1,752 00	6	181	187	85	18	377	3,151,811 46	18
2,447 34	2,267 45	2,118 58	8	374	140	90	16	628	798,648 70	19
2,430 22	2,404 37	2,379 96	15	324	226	256	13	834	1,452,137 44	20
1,158 15	1,406 56	1,134 99	.....	143	69	29	7	248	469,835 03	21
2,075 58	2,252 92	1,711 45	10	532	256	202	37	1,037	1,659,486 07	22
221 10	180 05	243 35	.....	25	6	7	2	40	143,649 85	23
1,886 88	1,838 47	1,914 22	20	357	234	178	15	806	1,695,103 30	24
1,019 22	958 45	964 49	6	94	32	17	.....	149	154,310 33	25
1,471 95	1,429 80	1,260 35	10	166	92	44	.....	312	373,206 16	26
1,573 71	1,658 85	1,520 78	3	228	137	68	5	441	572,752 56	27
1,007 63	1,039 70	1,327 65	2	162	84	53	8	309	10,934,169 13	28
2,938 52	2,798 18	2,558 51	10	315	185	181	50	741	1,400,963 90	29
2,506 03	2,636 20	2,737 75	6	378	197	89	15	685	1,010,877 20	30
468 54	961 25	941 01	.....	102	14	2	1	119	80,083 20	31
2,585 21	2,821 35	2,872 65	1	246	158	186	25	616	814,802 96	32
302 20	.....	.....	.....	26	10	18	3	57	114,960 00	
1,193 45	1,067 50	1,070 55	.....	150	72	57	4	283	2,901,749 00	33
1,170 60	1,355 00	1,145 75	1	147	20	6	2	176	155,748 41	34
2,020 32	2,017 64	2,187 75	.....	316	107	90	12	525	3,202,363 00	35
3,188 65	1,867 95	1,586 47	5	212	79	51	9	356	4,440,234 95	36
1,275 10	1,259 15	1,064 95	1	67	32	28	1	129	188,764 22	37
1,000 00	1,867 95	1,586 47	9	159	62	19	6	255	288,931 69	38
1,000 00	.....	.....	10	194	70	30	7	311	74,339 88	
2,056 80	1,801 94	1,563 26	3	262	126	101	22	514	821,420 30	39
3,710 50	3,075 82	2,521 67	10	720	530	610	207	2,077	5,870,118 00	40
2,749 56	2,506 73	2,475 92	5	343	172	205	57	782	2,722,984 00	41
1,039 1.	821 50	867 85	6	139	34	10	5	194	170,223 91	42
1,814 40	1,107 25	1,028 51	4	144	71	116	94	429	715,373 00	43
2,227 96	2,249 76	1,901 52	15	226	158	148	14	561	961,128 20	44
989 55	1,016 25	1,082 00	5	60	67	75	12	219	951,682 02	45
2,643 57	2,476 88	2,176 76	4	314	170	109	20	617	9,215,140 53	46
1,952 16	1,659 08	1,423 70	3	217	102	76	8	406	561,258 17	47
839 20	845 21	955 55	1	124	47	21	3	1	2,725,335 00	48
19 55	.....	.....	.....	.....	.....	.....	.....	.....	.....	49
1,728 47	1,918 40	2,009 56	22	289	84	68	12	475	549,995 36	50
1,605 65	1,751 00	1,375 00	2	245	89	55	7	398	494,299 54	51
2,886 71	2,774 90	2,655 06	37	821	318	171	33	1,380	2,842,168 35	52
1,577 93	1,780 63	1,516 10	1	215	70	45	4	335	387,833 79	53
413 95	234 00	.....	12	59	30	21	5	127	183,078 21	54
6,507 02	5,301 81	3,910 90	12	585	285	191	110	1,183	2,952,592 82	55
5,325 45	4,799 95	4,330 95	34	1,870	1,512	1,148	545	5,109	17,634,613 00	56
5,561 55	2,423 30	4,659 25	65	2,696	2,694	1,432	190	7,077	23,441,708 00	57
1,334 24	2,601 30	.....	6	190	83	70	11	360	1,480,301 17	58
2,022 26	1,573 13	1,450 68	18	443	338	186	48	1,033	1,829,094 32	59
2,885 14	2,336 86	2,023 93	11	541	247	103	28	930	11,925,787 00	60
1,288 95	2,637 79	2,442 21	1	112	75	95	14	297	558,033 00	61
1,811 60	937 00	1,117 45	17	275	100	150	24	566	2,262,804 49	62
4,701 86	1,639 76	1,534 98	.....	1,368	836	439	121	2,764	22,841,811 00	63
2,868 36	2,605 55	2,373 40	.....	952	455	286	126	1,819	3,982,287 00	64
1,612 70	1,568 68	1,551 17	2	226	68	76	13	385	581,116 44	65
130,963 48	117,478 16	110,238 80	507	22,457	15,319	9,307	2,267	47,562	181,636,807 22	

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FOURTEENTH ANNUAL REPORT

OF THE

Provincial Municipal Auditor

FOR

1910

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1911.

Printed by
WILLIAM BRIGGS,
29-37 Richmond Street West,
TORONTO

To His Honour The Honourable John Morison Gibson,
Lieutenant-Governor of Ontario:

May it Please Your Honour:

I have the honour to present to you the report of the Provincial Municipal Auditor for 1910.

J. J. FOY,

Attorney-General.

Parliament Buildings,
Toronto, January, 1911.

Toronto, January, 1911.

To The Honourable J. J. Foy, K.C., M.P.P.,
Attorney-General for Ontario.

Sir,—I have the honour to present to you my report for the year 1910.

I have the honour to be,
Sir,
Your obedient servant
J. W. SHARPE,
Provincial Municipal Auditor.

Report of the Provincial Municipal Auditor

TORONTO, 31st December, 1910.

TO THE HONOURABLE J. J. FOY, K.C., M.P.P.,
Attorney-General for Ontario.

SIR,—I have the honour to submit to you the Fourteenth Annual Report of the Department of the Provincial Municipal Auditor.

In my annual report for 1909, I referred to the difficulty, and in many cases the impossibility, of obtaining any information or reports from the officials of local municipalities. My experience during the past year of 1910 confirms the views which I then held, and has impressed upon me more strongly the absolute necessity for legislation along the lines stated in my 1909 report.

A very few of the local treasurers have forwarded to me a copy of the Annual Auditor's Report as I had previously requested. Many of them do not appear to desire a review of their accounts. The Bureau of Industries has forwarded me many copies in addition to the few received from treasurers, and I have, as far as possible, reviewed them. A number are in fairly good shape, although very few comply in every respect with the requirements of the Municipal Act. Auditors recognize the importance of a careful checking and examination of the accounts, but they do not appear to realize that publicity is equally important, and that the result of their examination should be set out in their reports with detail, clearness and simplicity, so that each ratepayer may readily understand the financial history of the municipality. An exhaustive audit is good, but with publicity added, it constitutes the best check upon possible error, peculation or extravagance. I would therefore say to auditors—search diligently and place the result of your search before the public without fear or reserve.

In my report for 1909, I directed the attention of local auditors to the legislation prescribing their duties, including that of examining and reporting upon the bonds of the treasurer and collector. I do not mention this as being the most important duty, but rather as the one which appears to have been generally neglected. In very few cases do I find that a proper report has been made.

It appears to be necessary to direct the attention of the municipal treasurers to the provisions of Sub-sections 2 and 3 of Section 47, of the Public Schools Act, Chapter 89, of 1909, which say:

(2) "Every Municipal Council shall annually account for all moneys collected for public school purposes, and pay over the same to the School Board of the municipality, or of the Section.

(3) "When the Municipal Council collects from the public school supporters of any municipality or of a School Section any sum in excess of the sums disbursed on account of the Public School or Schools within such Municipality or Section, such excess shall be credited to and paid over to the Board on whose account it has been collected."

I find in many cases that the provisions of these two sub-sections have been ignored, no separate accounts have been kept of school moneys, and where a surplus existed it was paid into the general fund of the municipality.

The examination of these reports with their various imperfections, some of little importance, others very material, has led me to the conclusion that whilst the audit and report by local officials are useful and necessary in the economy of municipal government, in addition thereto this Department should be placed in a position to review annually the accounts of each municipality in the Province, except cities and towns over 15,000 population. I am convinced that the conferring of authority and the creation of facilities for the supervision of municipal work as set forth in the Municipal and Assessment Act would meet with public approval, and would bring under governmental control matters that are now quite unprovided for.

Municipal Accounting.

The multifarious duties of the local governing bodies in the several municipalities and the works to be carried out by them are intimately associated with the welfare of all classes of the people. They are more important than is often realized. Upon them depends the administration of the laws, looking to the preservation of the public health, the protection of food and water from contamination, the construction of works for the carrying off and disposal of sewage, the providing of good roads and walks, raising funds for the erection of school houses and other expenses in connection with the educational system, controlling systems of lighting, and many minor services, all of which are close to the daily life of the people. In these various branches of public service there is a community of interest embracing very many of the municipalities of the Province of Ontario. In order that each municipality may have the benefit of the experience of every other municipality and be in a position to make a proper comparison of the cost of each branch of municipal service, it is necessary that a uniform system of grouping or classification of municipal revenues and expenditures should be adopted, and a reliable basis be thus furnished for the preparation of municipal statistics. Whether this grouping or classification can best be done by the local municipal officers or by a department of the government, is a matter for consideration. With the rapid growth of the Province, the adoption of public utilities and the natural increase in many branches of public buiness, the work of municipal officers is becoming more complex. The salary of the municipal officer is usually measured (not very generously) by the work he is expected to do for the municipality alone. Returns to be made by him to the Government Departments are seldom taken into consideration. It is natural, therefore, that he should feel reluctant to do work which to him appears to be intricate, of little importance and unremunerated. The duties, however, of a municipal officer are not confined to merely local affairs. Each municipality is a unit in the great aggregation of municipalities—the Province of Ontario—and the success of municipal government in the Province largely depends upon a uniformity of system in the work of the municipal units. Local officials whilst efficiently performing their local duties should keep in view the duty they owe to the larger community, and promptly furnish reliable information for the benefit of their sister municipalities. As the wider duty is for the benefit of the Province at large, it would seem that local officials may fairly look for such assistance as an organized municipal department, under government, would afford them.

Applications for Audit.

I have repeatedly been asked for information as to the proper form of application for a special audit. The following form may be used:

"Dated 19

"To His Honour,

The Lieutenant-Governor in Council.

We the undersigned ratepayers of the of in the County of and residents in said of , respectfully petition Your Honour to direct the Provincial Municipal Auditor or some competent person to be named by him to make an inspection, examination and audit of the books, accounts, vouchers and moneys of the said of for the following and other reasons:—"

In continuation of the above form, must be added a concise statement of the reasons for asking for the audit. In some cases the petition has been signed by the ratepayers, and the reasons have been written on a separate sheet of paper, without any signatures. This will not be accepted, the reasons must be set out in the petition over the signatures of the petitioners.

A statutory declaration will also be required, to be made by some person who saw the petition signed by the several petitioners. It is not necessary that the same witness should testify to all of the signatures, several statutory declarations may be used if necessary. The declaration may be made before any person authorized to administer oaths.

The following form may be used:

"County of
To Wit.

In the matter of the petition of and others, and the of

"I of the of in the County of , do solemnly declare, that I was present and did see the annexed petition duly signed by

(Fill in names)

and that each of said parties is a ratepayer of and resident in the said of , and I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of The Canada Evidence Act.

Declared at the of in the County of this day of A.D., 19 before me ."

Recommendations.

I beg to direct your attention to the following:—

Section 389 of The Municipal Act of 1903, provides that "every by-law (except for drainage as provided for under the Municipal Drainage Act or for a work payable entirely by local assessment or under Section 9 of The Act for the improvement of public highways passed in the first year of the reign of His Majesty, King

Edward the Seventh) for raising upon the credit of the municipality any moneys not required for its ordinary expenditure and not payable within the same municipal year shall before the final passing thereof be submitted to the electors of the municipality in the manner provided for in Section 338."

There are many by-laws authorized by the Municipal Act which are intended to be exceptions to the operation of the above Section 389, but are not included in the exceptions set out in the Section.

I respectfully recommend:

(a) That Section 188, of Chapter 23, of Statutes of 1904, be amended to provide for the repayment to the municipality of any moneys advanced to make up any deficiency under the Section. As the Section now stands, any deficiency in tax receipts arising in a school section or any locality must be made good by the whole municipality without any provision for repayment.

(*b*) That Sub-section (3) of Section 304 of The Municipal Act of 1903 be amended by inserting the words "and tax collector" after the word "treasurer" in the third line of such Sub-section.

(*c*) That Sub-section (1) of Section 9, of Chapter 228, R.S.O., be amended by striking out the words "in the hands of the treasurer or collector thereof," in the fifth line of such Sub-section, and substituting the words "or in any way affecting the corporation or relating to any matter under its control, or within its jurisdiction."

(*d*) That Sub-section (2) of said Section 9, be amended by striking out the words "in the hands of its treasurer, collector or other officer."

(*e*) That said Chapter 228 be amended to charge the expense of an audit of School Board accounts against the School Board and to require officers of School Board to observe all recommendations made by the Auditor. As the Act now stands the whole municipality is charged with the expense of an audit in any School Section, which is manifestly unfair.

(*f*) That Sub-section (1) of Section 12 of said Chapter 228, be repealed and the following substituted therefor:

(1) Every officer of any municipality or School Board, and every person having charge, possession or control of any books, accounts, vouchers or documents the property of such Municipality or School Board, or relating to any matter under the jurisdiction of such Municipality or School Board shall, whenever requested so to do by the Provincial Municipal Auditor, at all reasonable times produce and exhibit to said auditor or his substitute for examination and inspection all or any of such books, accounts, vouchers or documents.

(*g*) That Sub-section (2) of said Section 12 be amended by striking out the word "treasurer" in the first line thereof, and substituting the words "such officer or person."

AUDITS BY DEPARTMENT.

Fort Frances.

In January, 1910, a petition signed by 36 ratepayers asking for an audit of the accounts of the Town of Fort Frances was received. Afterwards twelve of the petitioners presented a request in writing that their names should be withdrawn from the petition. The circumstances were investigated and the prayer of the petition was refused.

In April, 1910, a second petition signed by 37 petitioners was received. The petition was not in order and was returned to the promoters with instructions for its amendment. The instructions have not been carried out and the petition has apparently been dropped.

Township of Hanmer.

In January, 1910, a petition was received from resident ratepayers of the Township of Hammer asking for an audit. The prayer of the petition was granted. Mr. Oscar Hudson was appointed and made the necessary examination. His report is submitted herewith. Costs of this audit, $266.

City of Niagara Falls.

The Council asked for an audit in January, 1910, by resolution. Upon request information was furnished to them and upon reconsideration they rescinded their former resolution.

Township of East Gwillimbury.

In February, 1910, a resolution was passed by the Council asking for a special audit and shortly afterwards a petition from the ratepayers to the same effect was received. The examination was made by Mr. H. R. Morton, whose report is submitted herewith. Costs $246.25.

Town of Port Hope.

In February, 1910, a petition signed by 47 resident ratepayers of the Town of Port Hope and a resolution of the Town Council to the same effect were received. Mr. J. Frith Jeffers, of Belleville, was appointed, and made the necessary examination. His report is submitted herewith. Costs of this audit $922.61.

Township of Aldborough.

In May, 1910, a petition was received praying for an examination and audit of the accounts of the Township of Aldborough. The petition had been prepared in the year 1907, and was in a dilapidated condition. It originally bore the date, 5th August, 1907, which had been erased and May 23rd, 1910, substituted. It was returned to the promoters on 26th May, and they were advised that it could not be received in its then condition. No further communication has been received.

Township of Chatham.

This audit had been ordered during the incumbency of my predecessor, the late Mr. Laing. Owing to the large number of intricate drainage accounts, the examination was greatly prolonged and was not completed until July of the present year. The examination was made by Mr. A. F. Falls, of Chatham, whose report is submitted herewith. Costs of this audit, $1,471.70.

Township of Tilbury West.

In March, 1910, a petition was received from resident ratepayers in the Township of Tilbury West, asking for an audit. At my request the matter was discussed between the promoters of the petition and the Township Council at a

meeting held at Comber, at which meeting I was present. After due investigation the prayer of the petition was granted and Mr. W. J. Ross, of Barrie, was appointed to make the necessary examination. His report is submitted herewith. Costs of this audit, $995.59.

Town of Gravenhurst.

In May, 1910, a resolution of the Council of the Town of Gravenhurst and a petition signed by resident ratepayers of the Town were received asking for an audit of the accounts of the said Town. Mr. E. C. Davies was appointed to make the necessary audit. His report is submitted herewith. Costs of this audit $1,520.

Township of Mersea, Township of Evanturel, Town of Sturgeon Falls.

Audits in these municipalities were ordered last year and are referred to in my 1909 report. The report in each case is submitted herewith. Costs are as follows: Mersea, $1,882.84; Evanturel, $558.28; Sturgeon Falls, $686.35.

Town of Perth.

In the month of September, 1910, a petition was received from resident ratepayers of the Town of Perth. I had previously made an examination of the books and a report thereon and considered that an audit was advisable. Mr. A. B. Scott was appointed to make the necessary examination and his report is submitted herewith.

Costs of this audit, $600.

Township of Prince.

In February, 1910, a petition was received from ratepayers of the Township of Prince asking for an examination and audit of the books and accounts of the Municipality. The Council objected to the audit upon the grounds that the revenues of the Township were not large, and the expense of the audit would be relatively very burdensome. I examined the auditor's reports for several years and did not discover any material errors, although the reports have not been prepared with absolute accuracy, and an effort should be made to reduce the large amount of taxes in arrears. Under instructions from the Council, Mr. Dawson, C. A., of Fort William, has undertaken an audit, and the petition is held in abeyance until receipt of his report.

Township of Balfour.

On the 20th December, 1910, a petition signed by 35 resident ratepayers of the Township of Balfour was received asking for an audit of the accounts of the Township. The Township Council by resolution have made the same request. The prayer of the petition was granted and Mr. W. J. Ross of Barrie was appointed and is making the necessary audit.

Township of Zone.

In the month of June, 1910, a petition was received signed by 33 ratepayers of the Township of Zone asking for an audit of the accounts of that Township, and in the same month the Township Council passed a resolution offering no objection to the audit. The prayer of the petition was granted. Mr. A. F. Falls, of Chatham was appointed and is now carrying on the audit.

School Section No. 7 Galway.

In November a letter was received from Mr. G. E. Broderick, Public School Inspector, directing attention to the financial affairs of School Section No. 7 Galway. Upon investigation I found that there are very few ratepayers in the section, the annual revenue is small, and the cost of a Government audit should be avoided if possible. At my request, the Inspector forwarded to me all the papers that were in his possession. The condition of the books and accounts of the School Treasurer is intolerable, but the remedy can be applied by the supporters of the school with the assistance of local auditors. I do not consider it advisable that a Government audit be undertaken at present, and recommend that the present treasurer be required to resign and a new treasurer be appointed.

City of St. Catharines.

In the month of November a petition was presented, signed by 42 resident ratepayers of the City of St. Catharines, asking for an audit of all accounts of the Municipal Corporation of the City and the accounts of the St. Catharines Waterworks Commission. On 14th November the City Council of St. Catharines by resolution employed Mr. H. Vigeon to examine the books of the City Treasurer and the various associated boards. The Council further, by memorial to His Honor the Lieutenant-Governor in Council, prayed that the request contained in the petition be not granted. It has been decided to hold the petition subject to further consideration of anything that may arise.

I have the honor to be, Sir, your obedient servant,

J. W. Sharpe.

TOWNSHIP OF CHATHAM AND GORE.—PROVINCIAL AUDIT.

Report of Special Inspection, Audit and Examination of the Books, Accounts, Vouchers, and Moneys of the Municipal Corporation of the Township of Chatham and Gore in the County of Kent.

Upon the authority of an Order-in-Council approved by His Honor the Lieutenant-Governor of the Province of Ontario, the 19th day of November, 1908, A. F. Falls, Chartered Accountant, of the city of Chatham, was instructed and empowered to make an inspection, examination and audit of the books, accounts, vouchers and moneys of the Municipal Corporation of the Township of Chatham and Gore in the County of Kent, under the provisions of Chapter 228, R.S.O., 1897.

In pursuance of the said authority and instruction, the said A. F. Falls hereby reports that he has made an inspection, examination and audit of the various accounts of the said Corporation.

The audit is made upon the petition of certain ratepayers, addressed to the Provincial Municipal Auditor.

The petition requests that the examination be made for the following reasons:

(1) That the financial statement issued in December and distributed among the Ratepayers does not contain a record of all payments for which orders were issued to date of statement.

(2) That payments have been made without proper authority.

(3) That the accounts do not clearly show if all payments for drainage were charged to the drains or paid out of the General Funds of the Township.

(4) That sums of money raised under local improvements by-laws for drainage purposes and remaining as surpluses after the completion of the works for which they were raised have been retained instead of being repaid or credited to the ratepayers entitled thereto.

(5) That in no case within the last ten years have the arrears of taxes been returned to the County Treasurer within the proper time, whereby considerable loss of interest has been sustained by the Township.

Scope of Audit.

The inspection and examination, under the authority of Order-in-Council, cover the accounts of the Municipality since 1898.

A. McArthur has held office of Clerk continually during a period covered by the audit.

A. W. Crow held the office of Treasurer to December 31st, 1905, since which time Hugh Cummings, the present Treasurer, has held the office of Treasurer.

In conformity with my usual custom, the petitioners, members of Council and other ratepayers were invited to my office in Chatham on the 14th day of April, 1910, then and there to furnish such information or make such statements and charges as to them might seem proper respecting the conduct of the Municipal affairs of the Township. The Treasurers of School Sections were requested to bring their books for examination.

No specific charges were preferred, but complaint was made that taxes were too high.

With reference to the five complaints in the petition for the audit.

Financial Statement.

This statement is required under Sub-Sec. 6 of Sec. 304, Chap. 19 of the Consolidated Municipal Act of 1903. I have before me a financial statement prepared as on 14th of Dec., 1907. The receipts and disbursements are taken from the treasurer's cash book and ledger.

The amount included in the Assets and Liabilities as due to or from other municipalities is not taken from the treasurer's ledger, as there are no accounts in the books of the Treasurer for Dover Township, Camden Township, Sombra Township, or Dawn Township, although there are amounts included in by-laws against all four Townships to Chatham Township, which have not yet been paid.

The present method of every member of the council issuing orders, not only for their road divisions, but against other accounts, without ever being required to report to the council what orders they have issued from time to time, does not make it possible under the present methods of overcoming the matter of which is complained. The powers of members of the Council have been exceeded and are referred to elsewhere in this report.

Payments without Authority.

The complaint that payments are made without authority is taken up later under different headings in this report.

Drainage Accounts or General Funds.

The complaint that the accounts do not clearly show if all payments for drainage were charged to the drains, or paid out of General Funds of the Township; it is disclosed on examination of the accounts that drains have been charged with items which should be charged to the General Funds, and in a few instances the reverse is the case. By perusal of this report it will be seen that there was good reason for this complaint.

Drain Refunds.

The complaint that surpluses have been retained instead of being repaid after completion of the work. The manner in which the accounts of drains are kept in the treasurer's books is such that the account of the construction and repair of drains is mixed with the amounts collected to meet the debentures and the payment of debentures themselves. For this reason, some of the drain accounts which show a credit balance in the printed audit reports at the end of the year are in reality overdrawn, because the amount levied to meet a debenture has been credited the drain account but the debenture was not presented for payment during the same year. The drain accounts should not be charged with debentures or credited with amounts collected on the roll to meet them. That method of keeping books is too far behind the times to be continued in a municipality of such importance as Chatham Township.

There are some drains which have credit balances which should be rebated to the ratepayers unless the drains are to be repaired again in the near future. These can be seen by reference to the drain accounts in this report.

Tax Rolls.

The complaint that arrears of taxes are not returned to the County Treasurer within the proper time, causing loss of interest to the township, is on examination found to be serious.

It has never been my experience to audit the books of any Municipality in which the Taxes have been allowed to remain so long unpaid, and where the loss was of such a large item as in the Township of Chatham.

In the Government Audit of 1903 of the books of the County of Kent, it was shown that the Township of Chatham lost by delay in amounts returned to the County Treasurer from 1891 to 1901 $865.19; more than three times that of any other township in the County. This was only calculated on the amount returned a year or more after the law required returns to be made. It refers to the 5 per cent. which the County Treasurer would have added on for one year if the returns had been made before May 1st of the year following the one in which the taxes were levied.

The following statement shows the dates on which the tax rolls were returned to the County Treasurer. The Rolls should have been in the County Treasurer's hands by April of the year following that of which the taxes were levied.

	Division 1.	Division 2.
1897	September 10, 1898	December 24, 1898.
1898	October 21, 1899	October 21, 1899.
1899	December 29, 1900	December 29, 1900.
1900	November 4, 1901	November 27, 1901.
1901	No arrears	July 30, 1904.
1902	November 25, 1903	July 30, 1904.
1903	No arrears	February 4, 1905,
1904	December 23, 1905	January 6, 1906.
1905	January 29, 1907	January 29, 1907.
1906	December 24, 1907	December 24, 1907.
1907	April 24, 1907	April 24, 1909.

1908 Rolls were not in County Treasurer's hands on April 16th, 1910, which is over a year later than they should have been returned.

Assessment and Collectors' Rolls

The Assessment Rolls do not contain a detailed list of property exempted from taxation and valuation.

The description of some property in sub-divisions is a cause of annoyance, as well as loss to the municipality. If proper plans were provided as authorised by the County Council in 1907 this difficulty would be overcome and the assessor materially assisted to perform his duties more accurately.

The Assessment Rolls have been compared with the Collectors' Rolls for each year covered by this audit and have generally been found accurate. A number of omissions from the Assessment Rolls were placed on the tax rolls.

The Assessment of the Township of Chatham and Gore is contained in one book, and for the collection of taxes there are two collectors' divisions. A summary is made in each collector's roll for each year, but no combined summary is

made of the two collectors' rolls showing the total taxes collected in each year from the ratepayers, for each of the different drains, for county, township, and other purposes. The lack of this information necessitated making out a summary to combine the two rolls each year covered by this audit, in order to check the total contained in the two rolls against the amount in the schedule of the by-law under which the levy was imposed for drains and other purposes.

The clerk's certificate appears in the collectors' rolls for each division each year.

None of the collectors' rolls for 1904, or any year since, contain the oath of the collectors in connection with the return of arrears of taxes against lands as required under Sec. 114 and 115, Chap. 23 of the Assessment Act of 1904. Section 113 of the same Act requires the collector to furnish the clerk of the township with a duplicate statement of unpaid taxes, which he makes to the treasurer. The Clerk, on receipt of the same, shall mail notices to each person with respect to whose land any taxes appear to be in arrears for that year. This has not been done.

Not in one single instance in the past ten years has any roll for the Township been returned to the Township Treasurer in the time prescribed by the Act.

The collectors of taxes have had a yearly job, their duties never ceasing; as soon as they returned one roll the other was handed them to collect. This manner of doing business is absurd.

The manner in which the collection of taxes in the Township of Chatham and Gore has been allowed to drag on for years does not reflect credit on those in control of the administration of the affairs of the Municipality. The extension of time for collection of taxes has been so abused in this municipality that, instead of the majority of the taxes of 1908 being collected in the year in which they were imposed, less than 15 per cent. were collected in 1908, and it was only after writing the Council twice requesting the return of the roll for the purpose of this audit that the Rolls were not let remain in the Collectors' hands till 1910, as has frequently been the case in former years. The township is really a year behind in the collection of the taxes, and the tax rate is higher by reason of this fact. The way in which the collection of taxes has been carried on in the past occasions a loss to the township in interest of hundreds of dollars a year; loss of 5 per cent. on arrears not returned to County Treasurer before May 1st each year of previous year's roll, and paying the Bank interest on overdraft by delay in collecting taxes to meet debentures when they mature as well as on funds to meet other expenditures.

In 1905 By-law 473 imposed 1 per cent. on taxes not paid by Jan. 31st of the year after they are levied. If the 31st of January is not a Saturday the time is extended till after the first Saturday in February. An additional 1 per cent. is imposed each month until 5 per cent. has been added.

In 1905 and each year since a column was provided for interest on the rolls. This was used by the collector of No. 2 division, but was not used by the collector of No. 1 division in any year.

The Rolls of 1905, 6, 7 and 8 have been carefully gone over and interest charged on all items in accordance with By-law 473. The Council have extended the times for imposing penalties from time to time verbally in a number of instances. This should not be done.

As a result of this audit, if the township derives the benefit of the collection of taxes at the proper time, this will make a saving of a large part of the cost of this audit every year in the future.

It would be in the interests of the township if by-law 473 were amended and 1 per cent. imposed on all taxes unpaid on Dec. 15th of the year in which the taxes

are imposed, and 1 per cent. additional on the 15th of each subsequent month till 5 per cent. is added. In this way the payment of taxes would be more promptly made and the collectors return their rolls so the County Treasurer could add 5 per cent. on May 1st of the year following that in which the levy is made.

Arrears of Taxes in the County Treasurer's Hands.

Comparison of the Arrears of Taxes ledger with the records in the County Treasurer's hands has been made. The accounts in the Treasurer's ledger, as due from the County treasurer, exceed the amount actually due. This is accounted for by the fact that the township treasurer had not made entries for items returned to the township clerk by the County treasurer to go on the rolls.

An adjustment entry has now been made.

Townline Accounts.

On examining the vouchers charged to these accounts I find a number of expenditures for upkeep of bridges. The exact location of the bridge is very rarely properly described on the voucher. On the Chatham and Dover townline most of the bridges are part of the Chatham and Dover Townline Drain, Chatham and Dover Townline Extension Drain or Chatham and Dover Townline Extension Relief Drain, and the commissioners of the divisions, who have charge of the expenditures, should examine the map and see what account repairs should be charged to. It is my opinion that more care might have been exercised in the past in connection with this matter.

Tupperville Bridge.

The account in the Treasurer's ledger under this heading has been used since the construction of the bridge was completed, to credit the annual levy to meet the debenture and charge the debenture up. Debentures redeemed will in future all go through Debenture Redemption Account.

The upkeep of this bridge and caretaker's remuneration is all charged to general funds. The balance at the credit of this account since its completion has now been transferred to general funds.

Fixed Assets.

The township owns the townhall, some road scrapers, and has an asset in the roads, culverts and bridges, particularly Tupperville bridge. No accounts appear in the Treasurer's ledger for any of these.

An account has now been opened in which the townhall is entered at an estimated value of $2,500.00. The other assets of the township in roads, bridges and road scrapers have not been included, as they could not be realized on, and there is a vast difference of opinion as to what value should be placed on them. They are assets of the township, but not available.

Drainage Accounts.

A careful examination of all the drainage accounts has been made.

A number of the drain accounts were found to be mixed.

The lack of a township map, showing the location of the different drains, was given most frequently as the reason for the charging of items to the wrong drain account. Members of council say that they had often to rely on the people, in the locality where the drains are located, to tell them the name of the drain to which orders for repairs should be charged.

To overcome this difficulty in the future and that this audit may be a lasting benefit, I am furnishing a large map of the whole township and gore on which is shown every drain under the Municipal Drainage Act in the township as well as drains of neighbouring townships to which Chatham township contributes.

Highway Bridges over Drains.

Sub-section 1 of section 9 of the Municipal Drainage Act gives the Engineer power to assess bridges and culverts on highways, and apportion the cost and upkeep between the drainage work and the Municipality or Municipalities having jurisdiction over such public highway as to him may seem just. Bridges assessed by the Engineer under sub-section 1, section 9, must be maintained in that proportion till another engineer's report varies the assessment. During the period covered by this audit, a number of bridges assessed by the engineer to be maintained in whole or in part by the municipality have by subsequent engineers' reports been constituted part of the drain, these, as long as the by-laws existed requiring all or part to be maintained by the Municipality, have had to be charged to the accounts as directed in the engineer's report. It is remarkable, that hardly a single item was charged to the Municipality for repair or upkeep of these bridges and culverts on which the engineer's report required the Municipality to pay all or part. The drains were charged with all the repairs.

The same methods as were found in my examination of the accounts of Dover township are found to exist in the handling of the charges in connection with bridges, which are made in whole or part a charge against the Municipality.

In the Dover Audit a number of written questions were submitted to Matthew Wilson, K.C., who gave written answers. Such questions as apply to the accounts in Chatham township are reported herein. The question in reference to bridges is as follows:

Question—

When the engineers, under sub-section 1 of section 9 of the Drainage Act, report a bridge or bridges on a drain to be charged in whole or part to the Municipality.

Will damage to a bridge, caused by the flow of water in the drain during floods, in any way affect the engineer's report and permit the legally charging of the maintenance or repair in whole or part of the bridge or bridges to the drain account?

Does the maintenance of such a bridge remain a charge against the Municipality till another engineer's report is adopted, repairing or enlarging the drain?

Matthew Wilson's Opinion.

"The damage to the bridge caused by the flow of water cannot change the effect of the engineer's report. No matter what may be the cause of the damage to the bridge it ought to be repaired and the cost of repairs charged in the first instance in the manner directed by the engineer's report. If the report charges the

cost partly to the Municipality and partly to the drain, then that report must be followed, but if the report charges the whole cost to the Municipality, then the Municipality must bear it. Of course, the Referee has power to appeal to vary the proportions if appealed to within ten days after the making of the report."

"The maintenance of the bridge remains a charge against the Municipality, or partly against the Municipality and partly against the drain, until some future report of the Engineer under the provisions of the Drainage Act varies these proportions."

There are not less than one hundred such bridges in Chatham township and Gore, which under the engineer's report are a charge in whole or part against the general funds of the township.

In examining more than fifteen thousand orders for payments issued during the period covered by this audit, it was necessary to pick out all the charges to drain accounts for repairs to bridges on drains where any bridges were made under the engineer's report a charge in whole or part to the general funds of the Municipality. After this was done it was necessary to go over these vouchers with the members of the council or commissioners who issued them to ascertain where the bridge or bridges were located that the voucher referred to, before it could be ascertained if the charges were correct.

It seems absurd, but it is, however, a fact, that not one order in every ten, issued for payment of material or work performed on bridges in this township, mentions where the bridge is located. They merely state "for bridge" and give the name of the drain. In most instances they do not state whether for bridges from farm to the highway or a bridge over the drain from one part of the highway to another.

Councillors or commissioners on drains should state where the bridge is and whether a highway bridge to the farm or a bridge on the road over the drain.

The original drainage by-laws are carefully kept by the Clerk, who transcribes them in a book for that purpose, or pastes in a printed copy. He also keeps a drainage levy book.

Frequently the engineer's estimates have been altered by the Court of Revision, but this has not been the case in recent years.

Interest has not been taken into account in this report in connection with drains or other overdrawn accounts in the books of the township.

Debenture Redemption Account.

It is not in the interests of the township that the collections on rolls to meet debentures go to the credit of drain accounts. The argument used is that it makes no difference, as the Clerk and Treasurer know the standing of the drain account whether overdrawn or not.

I cannot impress upon the officials and members of council the importance of excluding debenture payments and levies to meet them from drain accounts more strongly than by stating the case of the Chatham and Dover Townline Drain. In 1901, after the drain was nearly completed, the account showed an overdraft of $187.12. But it had been credited with $1,333.22, first levy, to meet the debentures in 1901. The debenture was not paid till 1902. In 1902 first debenture was paid and second levy collected, leaving levy for one debenture at the credit of the drain account. In 1902, $628.70 was expended on the drain, the account showing account overdrawn $815.82 after drain was completed, but should have shown overdraft of $1,333.22 more, or cost of drain $2,149.04 more than realized by sale of debentures and paid in by Dover Township.

If this condition had been known in 1902 the council could have proceeded to collect from Dover Township their portion of the increased cost of the drain over the engineer's estimate. As it is now by-law 546 was passed in 1907 to collect overdraft as shown in the treasurer's ledger, $161.13 of which has not been collected from Dover. The drain account is now $1,638.09 overdrawn and it is very doubtful if part of this can be collected from Dover for an overdraft which actually existed in 1901, but owing to the obsolete method of running the books had not been found out till the present time.

This method as shown in this one example is too expensive a luxury for the township, to be continued. Entries have been made taking all collections to meet debentures unpaid out of the drain accounts and placing them in Debenture Redemption account.

MUNICIPAL DRAINAGE MAP AND EXPLANATION OF MANNER OF MARKING DRAINS AND BRIDGES.

There was no township map indicating the location of the different drains or to show what part of the drains by the same name were covered by the different by-laws.

In order to follow properly the drain accounts, to know where expenditures were made, and enable the members of council and officials to intelligently answer questions on the expenditures on account of drains in the past, and to state where the charge should be made, a map had to be prepared showing all the Municipal drains of the township. This was found so useful during the work of the audit, and the lack of such information having caused so many errors in the drain accounts, that I decided to furnish the Municipality along with this audit report, copies of the map for the townhall, Clerk's and Treasurer's offices, and a copy for each councillor for his use while a member of the Council, 10 copies in all. One on which the clerk will show the area of each School section.

On this map is shown all Municipal drains, with the name, number of by-law, and each section of a drain covered by a separate by-law in a different color from that of any other section of the drain by the same name. This map is on linen paper and can be folded and carried continually by members of Council.

The proper by-law to which any item for repair to a drain is to be charged can easily be seen. If the expenditure is on a bridge to be maintained by the Municipality the fact will be known from the circle drawn on the map at the point where such bridge is located.

The map is prepared from engineer's plans of drains, and information from whatever source it could be obtained without incurring the expense of searching the registry office, and is as near accurate as the information at my disposal will permit. On it is shown in circles all bridges over drains that the engineer has constituted a charge to the roads and bridges account or general funds of the Township.

The bridge over McDonald tap drain north of Sydenham River on base line marked with three red circles is to be maintained by the general funds of Chatham and Dover townships, one half each.

As full particulars and history of the by-laws of each Municipal drain as could be ascertained from the records is given to enable each ratepayer to read for himself the time and manner in which the drains were constructed and repaired.

The details of the different drains are given under their respective names in alphabetical order, which will interest the ratepayers and will enable the members of the council to use the map to advantage, and are as follows:

Arnold Drain.

There was an account in the Treasurer's ledger under this head with an overdraft of $16.46. No levy has been made against any such drain since 1892. The Treasurer in his evidence stated that he did not know where the drain was located.

This amount has now been written off.

Adkin Drain.

Originally constructed under by-law 353, Nov. 10, 1899, on report of W. F. O'Hara.

In 1908 there was an amount collected on the roll to cover overdrawn account for which no by-law appears in the books.

Baseline West Drain.

Originally constructed in 1874, by-law 28, on report of Walter Crowe, from a line between lots 20 and 21 to lot 13 in the Gore of Chatham Township.

Under by-law 141, Nov. 3, 1888, on report of McGeorge and Flater, with provision for repair, the drain was improved.

Under by-law 326, July 28, 1898, on report of W. G. McGeorge, without provision for repair, this drain was repaired and improved. The engineer, under subsection 1 section 9, Municipal Drainage Act, made the upkeep of the following bridges a charge on the general funds of Chatham Township.

Bridge at Quennell sideroad.
Bridge at 15th and 16th sideroad.
Bridge at diverted road or Murray street.
Bridge at Albert Street.
Bridge across Baseline.
Bridge at River Road.

Under by-law 461, Aug. 1, 1904, on report of W. G. McGeorge, without provision for repair, this drain was to be improved from the River Sydenham to the first road from the north that reaches the Baseline east of the diverted road called Prince Street. The Engineer makes the bridges at River Road, Baseline and Diverted Road a charge to the drain. No action appears to have been taken under this by-law. Under by-law 593, Dec. 23, 1908, $173.30 was levied to cover overdraft.

Bear Drain.

Originally constructed under by-law 215, Oct. 20, 1892, on report of McGeorge and Flater, with provisions for repair. This provides an improved outlet to the Baseline and Watson Drain for which Camdem Township is assessed $67.50.

Under by-law 465, Aug. 15, 1904, on report of Wm. McGeorge, with provision for repairs, this drain was improved. The engineer under subsection 1, section 9, Municipal Drainage Act, made the upkeep of bridge at 12th and 13th sideroad a charge on the general funds of Chatham township. Camden township to contribute $93.50. In 1908 there was collected from Camden $68.63 in settlement.

Best Drain.

Originally constructed under by-law 213, Oct. 19, 1892, on report of McGeorge and Flater, with provision for repair.

Under by-law 387, 1901, $70.88 was levied to cover overdraft.

Under by-law 463, Aug. 1, 1904, on report of A. McDonnell without provision for repair, this drain was repaired.

Under by-law 540, Oct. 21, 1907, $34.11 was levied to cover overdraft.

Bedford Ellis Drain.

This drain was constructed in Cons. 4 and 5 in Camden township near the Chatham townline. In 1907, Camden township was paid $8.90, Chatham township portion. No by-law was passed; this must now be collected.

Big Creek Drain.

Originally constructed under by-law 138, Aug. 16, 1888, on report of McGeorge and Flater, with provision for repair, from lot 15, Con. 4, to Townline Extension drain making an additional outlet along 7th Con. road to the same drain.

Big Creek East of Cut-Off.

Under by-law 270, Dec. 23, 1895, on report of W. G. McGeorge, with provision for repair, save and except for the bridges, was improved from the Chatham and Camden townline to the Big Creek Cut-off Drain, where a barrier is placed in the channel of the old creek on the west side.

Big Creek Drain West and Tap.

Under by-law 369, Dec. 1st, 1900, on report of W. G. McGeorge, without provision for repair, this drain was improved. The engineer, under subsection 1, section 9, Municipal Drainage Act, made upkeep of the following bridges a charge on the general funds of Chatham Township:—

Bridge at 14th and 15th sideroad.
Bridge at 12th and 13th sideroad.
Bridge at 4th and 5th Con. road.
Bridge at Caledonia Road.
Bridge at Prince Albert Road.
Bridge at 5th and 6th Con. road.

Under by-law 538, Oct. 21, 1907, $452.57 was levied to be spread over three years to cover overdraft. In 1907 and 1908, $113.80 was credited instead of $178.61, this has now been corrected by crediting the account with $129.62.

Big Creek Cut Off Drain.

Originally constructed under By-law 169, Oct. 7, 1890, on report of McGeorge and Flater, with provision for repair. Camden Township contributed $2,128.39. The estimates did not provide for stone arch culvert under C. P. Railway.

Under by-law 291, March 11, 1897, cost of stone arch culvert under C. P. Railway, $4,551.32 was provided for, of which Camden Township contributed $1.550.00.

The annual levy to meet the debentures was placed on the rolls eleven years, the extra levy covered overdraft and leaves a credit balance.

Bissell Drain.

Under by-law 172, Oct. 17, 1890, on report of McGeorge and Flater, with provision for repair the drain was improved and extended to the Brown Drain.

Under by-law 496, Dec. 4, 1905, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The engineer made the upkeep of bridge at 1st and 2nd Con. road a charge on the general funds of Chatham Township.

Blackburn Drain.

Originally constructed under by-law 54, June 2, 1884, on report of W. G. McGeorge, with outlet into Brown Drain.

Under by-law 497, Dec. 4, 1905, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The engineer made the upkeep of bridge on the Caledonia road a charge on the general funds of Chatham Township.

Bolton Drain.

Originally constructed under by-law 425, Dec. 1, 1902, on report of W. G. McGeorge, without provision for repair. The engineer under Sub. Sec. 1, Sec. 9 M. D. Act, makes the upkeep of the bridge at the 18th and 19th Sideroad a charge on the general funds of Chatham Township.

Under by-law 539, Oct. 21, 1907, $139.29 was levied, spread over two years to cover overdraft.

Under by-law 626, Oct. 4, 1909, $46.41 was levied to cover overdraft of 1908.

Boyle Drain in Dover.

Under by-law in 1878 Chatham Township contributed $675,00 to Dover Township to construct this drain, on report of W. G. McGeorge.

Under by-law 118, in 1887 on report of A. McDonnell to the Township of Dover, Chatham Township contributed $1,258.80 to the construction of outlet for this drain.

Under by-law 190, Oct. 5, 1891, on report of A. McDonnell to Dover Township, with provision for repair, Chatham Township contributed $1,427.72 to improvement of this drain.

Under by-law 233, Nov. 3, 1893, on report of A. McDonnell to Dover Township, dated Aug. 13, 1892, which was appealed against by Chatham Township, the appeal was dismissed by the Referee. Chatham Township raised $781.37 to pay costs of appeal and their portion of costs of improving the drain.

Under by-law 484, July 24, 1905, on report of A. McDonnell, without provision for repair to Dover Township, Chatham Township contributed $1,829.00 to improve this drain. This was settled in 1906 for $1,789.00.

Under by-law 535, Oct. 21, 1907, on report of A. McDonnell with provision for repair, to Dover Township, against which Chatham Township appealed to the Referee; an agreement was reached and ratified by a by-law of each township which was approved by the Referee in his order dated March 16, 1907, Chatham Township to contribute $916.60 this was settled in 1908 for $867.06.

Under by-law 589, Dec. 23, 1908, rate of interest in by-law 535 was increased to 5½ per cent.

In 1903 Dover township was paid $100.95, but this was never levied for. Both Boyle Drain accounts are overdrawn. Amending by-laws should be passed.

Britton Drain.

Originally constructed under by-law 361, May 29, 1900, on report of W. F. O'Hara with provision for repair.

Under by-law 541, Oct. 21, 1907, $129.17 was levied, spread over three years, to cover overdraft, but the levy of 1909 was not placed on the roll. There have

been ten collections made to meet debenture payments, but only 9 debentures pand, the amount to meet the last debenture has been transferred to debenture redemption account. This leaves the drain account overdrawn, which will have to be collected.

Brown Drain.

Originally constructed under by-law 60, Sept. 12th, 1877, on report of A. McDonnell.

Under by-law 168, Sep. 22, 1890, on report of McGeorge and Flater with provision for repair.

Under by-law 488, Oct. 2, 1905, on report of W. G. McGeorge, with provision for repair, the main drain and branch were improved.

Under by-law 492, Oct. 2, 1905, on report of W. G. McGeorge without provision for repair to Dover Township, Chatham Township contributed $347.54 for improvement of this drain. In 1906, $315.54 was paid to Dover in settlement of this.

Burgess Drain.

Under by-law 201, Jan. 18, 1892, on report of W. S. Davidson to Sombra Township, with provision for repair, Chatham Township contributed $409.00 to repair of this drain.

Under by-law 542, Oct. 21, 1907, $304.58 was levied to cover overdraft, $101.52 of which is to be contributed by Sombra township. Action should be taken to collect amount still unpaid by Sombra Township.

Campbell Creek Drain.

Originally constructed under by-law of March 24, 1871.

Under by-law 393, Sept. 13, 1901, on report of A. McDonnell, without provision for repair, this drain was improved.

Under by-law 544, Oct. 21, 1907, $233.13 was levied spread over two years to cover overdraft.

Centre Creek Drain.

There was an account under this heading in the treasurer's books with a credit balance of $22.63, he knows nothing about the location of this drain. The balance has now been written off into general funds.

Campbell or Henderson Drain Outlet.

Originally constructed under by-law 512, May 2, 1906, on report of W. G. McGeorge, without provision for repair, providing a new outlet. The engineer under Sub-Section 1, Sec. 9 M. D. Act made the upkeep of the following bridges a charge on the general funds of Chatham Township:

Bridge at 8th and 9th Con. Road.

Bridge at 9th and 10th Con. Road.

Bridge at 10th and 11th Con. Road.

There were two Campbell Henderson Drain accounts in the treasurer's ledger. On examination it was found that nearly all the items should have been charged Campbell Henderson Outlet, in the first instance. Even the engineer's fees and publishing by-law were incorrectly entered. These have been consolidated into

Campbell Henderson Outlet Account. The treasurer in his evidence recommended the consolidation, and stated: "This would not incur any injustice to the ratepayers." The overdrawn account should be levied for.

Carleton Drain.

Under by-law 123, Sept. 17, 1887, on report of W. G. McGeorge, with provision for repair, the drain was improved and extended.

Under by-law 400, of 1901, $269.76 was levied to cover overdraft.

Under by-law 470, Dec. 5th, 1904, on report of W. G. McGeorge without provision for repair, this drain was improved, placing earth in the drain at lot 14, Con. 10, and the construction of Carleton Drain cut off under by-law 469. This is now called Carleton drain west.

Carleton Drain Cut Off.

Originally constructed under by-law 469, Dec. 6, 1904, on report of W. G. McGeorge without provision for repair.

Centre Road Drain South.

Originally constructed under by-law 303, Sept. 25, 1897, on report of W. G. McGeorge, without provision for repair. The engineer, under Sub-Sec. 1, Sec. 9, M. D. Act, makes the upkeep of the bridge on the Longwood road a charge on the general funds of the Township of Chatham.

Under by-law 521, Oct. 13, 1906, on report of F. W. Flater, with provision for repair, the drain was repaired. The bridge at Longwood road was made part of drain in this report.

Under by-law 585, Dec. 23, 1908, rate of interest in by-law 521 was raised to 5½ per cent.

Charteris Drain.

Originally constructed under by-law 12, Oct. 17, 1882.

Under by-law 208, July 7, 1892, on report of McGeorge and Flater, with provision for repair, this drain was repaired and improved.

Under by-law 545, Oct. 21, 1907, $133.40 was levied to cover overdraft.

This drain is being repaired under new by-law in 1910.

Chatham and Dover Townline Drain North of L. B. Creek.

Originally constructed under by-law of Jan. 4, 1872.

Under by-law 377, May 6, 1901, on report of W. G. McGeorge, with provision for repair, this drain was improved. Dover appealed to the Referee and from his decision to the Court of Appeal. The two townships made an agreement, which was ratified by each Council and approved by the Referee, by which Dover Township was to contribute $1,685.74. Under the engineer's report, all openings through the wagonway of the townline to be filled, half the upkeep of 9 bridges is made a charge equally on the two Municipalities under subsection 1, section 9, M.D. Act, the other half to be charged to the drain as follows:

Chatham township general funds to pay one-quarter of maintenance, and Dover township general funds to pay one-quarter of maintenance of 9 bridges at the points indicated below,

Bridge at River Road.
Bridge at 17th and 18th Concession Road.
Bridge at diverted road.
Bridge at 16th and 17th concession road.
Bridge at 15th and 16th concession road.
Bridge at 14th and 15th concession road.
Bridge at 13th and 14th concession road.
Bridge at 12th and 13th concession road.
Bridge at 11th and 12th concession road.

Under by-law 546, October 21st, 1907, $1,083.48 was levied over three years to cover overdraft. Dover township to contribute $161.13.

The Chatham and Dover Townline Drain account, under by-law 377, was credited with debenture levies when made, as these levies were placed on the roll one year in advance of the maturity of the debentures, the account has really been $1,333.22, more overdrawn since 1901, than the account showed, owing to the method of putting the amount of taxes to meet debentures to the credit of the drain account and charging the debentures when paid through the drain account. This amount has been charged the drain account and credited debenture redemption account.

This account is seriously overdrawn and should be collected.

Chatham and Dover Townline Drain, South of L. B. Creek. Called Townline Extension Drain.

In 1875, under by-law 35, this drain was improved on report of A. McDonnell.

Under by-law 148, July 25th, 1889, the drain was improved, on report of McGeorge and Flater, who stated when completed to be kept in repair as provided under report of A. McDonnell for original construction, viz., Municipality of Chatham 9/14, the Municipality of Dover 2/14 and for the Townline 3/14 to be borne equally by each municipality.

Under by-law 409, December 16th, 1901, $377.26 was levied to cover townline extension drain overdraft $94.32 to be contributed by Dover township and $288.15 by Chatham township.

Under by-law 566, October 21st, 1907, $264.33 was levied to be contributed, by Dover township $61.58, and Chatham township $184.75, to cover overdraft of townline extension drain.

Chatham and Dover Townline Extension Relief Drain.

Under by-law 368, December, 1st, 1900, on report of W. G. McGeorge with provision for repair, the drain was improved. The engineer in his report under subsection 1, section 9, M.D. Act, makes the upkeep of certain bridges a charge on the drains and municipalities as follows:—

Bridge at 7th and 8th concession road of Chatham, one-half charge Chatham township. One-half charge to the drain.

Bridge at 6th and 7th concession road of Chatham, one-half charge Chatham township. One-half charge to the drain.

Five bridges on Chatham and Dover Townline, one-half charge Chatham township. One-half charge to the drain.

Bridge at 9th and 10th concession in Dover E., one-half charge Dover township, one-half to the drain.

Bridge at 10th and 11th concession in Dover E., one-half charge Dover township, one-half to the drain.

Bridge at 8th and 9th concession in Dover E., one-half charge Dover township, one-half to the drain.

There was litigation over this drain which was adjusted by an agreement sanctioned by the Referee, by which Dover Township contributed $1,125.00 as their portion.

Chatham, Dawn and Sombra Townline Drain.

Constructed by township of Dawn, on report of Richard Coad. Starting at lots 13 and 14 in Dawn, running through W. half Lot 8, Concession 1, Gore of Camden into a small creek running into Drummond Creek.

Chatham township contributed $65.00 under by-law 100, November 4th, 1886.

Under by-law 320, May 19th, 1898, on report of A. Smith to Camden township, without provision for repair, this drain was repaired, to which Chatham township contributed $109.00.

Chinnick Drain.

Originally constructed, under by-law 30, August 13th, 1874, on report of A. McDonnell.

On December 23rd, 1886, by-law 107, $2,552.00 was raised to clean out and repair on a pro rata assessment.

On November 10th, 1899, under by-law 350, $2,002.00 was raised on report of W. G. McGeorge, without provision for repair, In his report the engineer makes the upkeep of the following bridges a charge on the general funds of the municipality under subsction 1 of sction 9, of the Municipal Drainage Act:

Bridge across 12th and 13th sideroad, concession 6	$35 00
Bridge across 6th and 7th concession road	35 00
Bridge across 7th and 8th concession road	35 00
Bridge across 12th and 13th sideroad, concession 8	35 00
Bridge across 8th and 9th concession road	35 00
	$175 00

On October 21st, 1907, under by-law 543, $254.07 was levied, spread over two years to cover overdraft.

Churcher Drain.

Under by-law 603, of 1909, on report of C. A. Jones, without provision for repair to Sombra township, Chatham township to contribute $133.00 for construction of this drain. The water to flow east and west. A flood gate to be provided near the dredge cut, between lots 18 and 19. There were no debentures sold and the levy is spread over five years, to be credited the drain account each year as collected.

The amount under by-law 603, has not been paid to Sombra township.

Danforth Creek Drain.

Originally constructed under by-law 102, November 4th, 1886, on report of W. G. McGeorge, with provision for repair, Camden township to contribute $16.00.

Under by-law 402, November 4th, 1901, on report of W. G. McGeorge, without provision for repair, this drain was repaired as directed by drainage referee. Camden Township to contribute $54.00. The engineer under subsection 1, of section 9, Municipal Drainage Act, made the upkeep of the following bridges a charge on the general funds of Chatham Township.

Bridge at 5th and 6th concession road.
Bridge at 18th and 19th sideroad in 6th concession.
Bridge at 6th and 7th concession road.
Bridge at 7th and 8th concession road.
Bridge at 18th and 19th sideroad in 8th concession.
Bridge at 8th and 9th concession road.

Under by-law 627, October 4th, 1909, $213.05, was levied to cover overdraft.

The amount under by-law 402, $54.00 has not been collected from Camden Township.

Davis Drain.

Originally constructed under by-law 10, in 1870.

Under by-law 249, September, 11th, 1894, on report of W. G. McGeorge, without provision for repair, this drain was improved.

Under by-law 508, April 2nd, 1906, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The engineer under subsection 1, section 9, Municipal Drainage Act, made the upkeep of bridges a charge on the general funds of Chatham Township as follows:

Bridge at 4th and 5th concession road.
Bridge at 5th and 6th concession road.

Dobie Drain.

Under by-law 378, May 6th, 1901, on report of W. S. Davidson to Sombra Township, dated June 5th, 1899, with provision for repair, Chatham Township contributed $952.00. This drain is in the east branch of Otter Creek and extends to near the south limit of lot 15, concession 3, Gore of Chatham, from which the dredge cut was extended to lot 18, to provide an outlet.

Under by-law 548, October 21st, 1907, on report of F. W. Flater, as to cost of construction of new bridge at 15th and 16th sideroad, $1,463.11 was levied to construct said bridge and cover overdraft to be contributed as follows:

Chatham Township	$148 29
Sombra Township	834 44
Dawn Township	480 38

The amounts due from Sombra and Dawn should be collected without further delay.

Dykeman Drain.

Originally constructed under by-law 367, December 1st, 1900, on report of W. G. McGeorge, without provision for repair. The engineer under subsection 1, section 9, Municipal Drainage Act, made the upkeep of the following bridges a charge on the general funds of Chatham Township:

Bridge at the River Road Gore of Chatham.
Bridge at 1st and 2nd concession road, Gore of Chatham.

Ebert's Creek or Norton Drain.

Originally constructed, under by-law 179, April 22nd, 1891, on report of J. W. Shackleton, with provision for repair.

Under by-law 299, May 28th, 1897, on report of W. G. McGeorge, without provision for repair, this drain was improved.

Everitt Creek Drain.

Originally constructed, under by-law 1, February 11th, 1873, on report of J. W. Shackleton.

Under by-law 385, in 1901, $46.32 was levied to cover overdraft.

Under by-law 499, December 4th, 1905, on report of W. G. McGeorge, with provision for repair, this drain was repaired and improved.

Fauser Drain.

Under by-law 520, October 13th, 1906, on report of W. G. McGeorge, with provision for repair, this drain was repaired, Sombra Township to contribute $277.99.

Under by-law 584, December 23rd, 1908, rate of interest in by-law 520 was increased to 51/2 percent.

There was a suit over this drain decided in favor of Sombra Township.

No entries have been made to adjust the account in reference to costs, as no copy of Referee's judgment appears among the papers of this drain.

This matter should be taken up with the Township Solicitor and entries made charging general funds with whatever amount the referee's judgment directs.

The balance should be promptly collected.

Fenton Drain.

Originally constructed in 1876, under by-law 46, on report of A. McDonnell.

Under by-law 391, of 1901, $226.80 was levied to cover overdraft.

Under by-law 592, December 23rd, 1908, $38.88 was levied to cover overdraft.

Fifteenth Concession Drain.

Originally constructed at a cost of $1,622.00 in 1876, under by-law 47, on report of A. McDonnell.

Under by-law 384, in 1901, $84.14 was levied to cover overdraft.

Under by-law 515, June 4th, 1906, on report of W. G. McGeorge, without provision for repair, this drain was repaired.

Fourth Concession Drain.

Under by-law 149, August 21st, 1889, on report of McGeorge and Flater, with provision for repair, this drain was improved from P. A. Road to its outlet in the Ouellette Drain in Dover Township, $95.00 for this was contributed by Dover Township.

Under by-law 408, December 16th, 1901, $544.96 was levied to cover overdraft.

Under by-law 537, October 31st 1907, on report of A. McDonnell, without provision for repair this drain was improved.

Under by-law 590, December 23rd, 1908, rate of interest in by-law 537 was increased to 5½ per cent.

Fraser Drain.

Originally constructed under by-law 247, September 11th, 1894, on report of W. G. McGeorge, with provision for repair.

Under by-law 549, October 21st, 1907, $353,93 was levied, spread over three years, to cover overdraft.

French Drain.

Originally constructed under by-law 305, October 29th, 1897, on report of W. G. McGeorge, without provision for repair.

The drain account is overdrawn, and an amending by-law should be passed to collect amount of overdraft.

George Drain.

Originally constructed under by-law 14, October 17th, 1882, on report of W. G. McGeorge, on a petition for a drain, on the north side of the Base Line, from westerly side of lot 24, to the easterly side of lot 26, with outlet into the stone drain after crossing the Base Line road.

Under by-law 389, of 1901, $162.00 was levied to cover overdraft.

Under by-law 551, October 21st, 1907, $27.00 was levied to cover overdraft.

Glasgow Drain.

Originally constructed under by-law at a cost of $1,744.00.

Under by-law 334, November 28th, 1898, on report of W. G. McGeorge, without provision for repair, the drain consisting of two branches was improved. The engineer under subsection 1, of section 9, Municipal Drainage Act, made the upkeep of the following bridges a charge on the general funds of Chatham Township:

Bridge across Baseline.

Bridge across 12th and 13th Sideroad.

Under by-law 550, October 21st, 1907, $72.67 was levied to cover overdraft.

Gray Drain.

Under by-law 78, September 10th, 1885, on report of A. McDonnell, with provision for repair, the drain was improved.

Under by-law 209, July 7th, 1892, on report of A. McDonnell, with provision for repair, this drain was improved and extended.

Under by-law 486, August 7th, 1905, on report of A. McDonnell, without provision for repair, this drain was improved, the excavation between Prince Albert road and Centre sideroad to be placed on the south side of the drain and formed into a bank.

Hardy Drain.

Originally constructed under by-law 167, September 12th, 1890, on report of McGeorge and Flater, with provision for repair.

Under by-law 509, April 2nd, 1906, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The engineer under subsection 1, section 9, Municipal Drainage Act, made the upkeep of the culvert at River road a charge on the general funds of Chatham Township. No debentures were sold for this, the levies as collected are credited the drain account, levies are yet to be made in 1910 and 1911.

Hazlett Drain.

Originally constructed under by-law 50, September 11th, 1876, at a cost of $2,355.00, on report of A. McDonnell, Township of Camden contributed $242.00.

On December 23rd, 1886, by-law 108, $553.00 was raised for repair on a pro rata assessment.

On October 2nd, 1896, by-law 282, on report of W. G. McGeorge, with provision for repair, the drain was improved at a cost of $1,055.80, $940.30 to be contributed by Chatham Township, and $115.50 by Camden Township. The engineer in his report under subsection 1, section 9, Municipal Drainage Act, makes the upkeep of bridge at 5th and 6th concession road a charge on the general funds of the Municipality.

On October 21st, 1907, by-law 552, raised $112.85 to cover overdraft.

Under by-law 552, October 21st, 1907, $127.17 was levied to cover overdraft.

In 1909, under by-law 604, on report of F. W. Flater, with provision for repair, the drain was improved and repaired at a cost of $966.00, $863.00 to be contributed by Chatham Township and $103.00 by Camden Township. In his report the engineer under subsection 1, section 9, of Municipal Drainage Act, makes the upkeep of bridges at road between 5th and 6th concession a charge on the general funds of the Township of Chatham.

Camden have not paid their portion of this drain. Debentures have not been sold.

Headley Drain.

Originally constructed under by-law 182, April 29th, 1891, on report of McGeorge and Flater with provision for repair.

Under by-law 396, of 1901, $41.84 was levied to cover overdraft.

Under by-law 448, October, 5th, 1903, on report of W. G. McGeorge, without provision for repair, this drain was improved. The engineer under subsection 1, section 9, Municipal Drainage Act, makes the upkeep of bridge across 12th and 13th sideroad a charge on the general funds of Chatham Township.

Henderson Drain.

Originally constructed under by-law 117, in 1887, on report of W. G. McGeorge, with provision for repair.

Under by-law 240, January 23rd, 1894, on report of A. McDonnell, with provision for repair, the outlet was enlarged from the junction of the Campbell and Henderson drains in the 8th concession through lot 6 in the 8th and 9th concession to the outlet into Little Bear Creek drain on the east side of Prince Albert road at lot 7, concession 10.

Under by-law 405, December 16th, 1901, $646.32 was levied to cover overdraft.

Under by-law 533, August 5th, 1907, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The engineer under subsection 1, section 9, Municipal Drainage Act, made the upkeep of bridges a charge on the general funds of Chatham Township, as follows:—

Bridge at 5th and 6th concession road.

Bridge at 6th and 7th concession road.

Bridge at 7th and 8th concession road.

Under by-law 588, December 23rd, 1908, rate of interest in by-law 533 was increased to 5½ per cent.

Indian Creek Drain.

Originally constructed under by-law 327, July 28th, 1899, on report of W. G. McGeorge, without provision for repair. The engineer under subsection 1, section 9, Municipal Drainage Act, made the upkeep of bridge at Fraser road a charge on the general funds of Chatham Township.

Irving Drain.

Originally constructed under by-law 61, of 1877, on report of A. McDonnell.

Under by-law 445, September 7th, 1903, on report of A. McDonnell, without provision for repair, this drain was improved.

This account is overdrawn, which should be collected.

Jenkins Drain.

Originally constructed under by-law 181, April 29th, 1891, on report of McGeorge and Flater, with provision for repair.

Under by-law 397, of 1901, $30.53 was levied to cover overdraft.

Johnston Drain.

Originally constructed under by-law in 1879, at a cost of $1,396.60, on report of W. G. McGeorge, with provision for repair.

Under by-law 214, October 20th, 1892, on report of McGeorge and Flater, without provision for repair, this drain was repaired.

Under by-law 514, June 4th, 1906, on report of W. G. McGeorge, without provision for repair, this drain was repaired.

Under by-law 628, October 4th, 1909, $91.61 was levied to cover overdraft.

Joiner Drain.

Originally constructed in 1893,

Under by-law 224, April 20th, 1893, on report of W. S. Davidson, to Sombra Township, with provision for repair, Chatham Township contributed $252.00 to the construction of this drain.

Under by-law 575, April 6th, 1908, on report of F. W. Flater, with provision for repair, to Sombra Township, this drain was repaired, Chatham Township to contribute $224.00.

No debentures were sold, the levies will be credited the drain account as collected.

Sombra have not yet been paid the $224.00.

Keifer Drain.

Under by-law 531, August 5th, 1907, on report of F. W. Flater, with provision for repair, this drain was repaired.

Under by-law 586, December 23rd, 1908, rate of interest in by-law 531 was increased to 5½ per cent.

Kerby Drain.

In 1878, under by-law 71, Chatham Township, contributed $90.00 to Camden Township to construct this drain according to report of J. W. Shackleton.

Under by-law 226, June 27, 1893, on report of A. McDonnell, to the Township of Chatham, with provision for repair, this drain in Chatham Township was improved. The assessment against Camden Township for this improvement was $190.00.

There was a new survey and report on this drain made in October, 1909, by J. J. Newman.

Kerby Ward Drain.

Originally constructed in 1891, by Camden Township on report of Goad and Robertson, with provision for repair, Chatham Township contributed $269.00 under by-law 186, June 25th, 1891. The engineer in his report with reference to maintenance states "That part within the Township of Chatham by the Municipality of Chatham at the joint expense of the lands and roads in Camden and Chatham paying for construction. The lands in Camden and Chatham paying one-half the cost of said maintenance in Chatham in the same relative proportion as for construction, and the lands and roads in Chatham paying the other half in the same relative proportion as for construction."

Lafferty Drain.

Originally constructed in 1875, under by-law 38, on report of A. McDonnell.

Under by-law 145, June 14th, 1889, on report of McGeorge and Flater, with provision for repair, the drain was deepened and the outlet improved.

Under by-law 411, December 16th, 1901, $335.37 was levied, spread over three years, to cover overdraft. The levy in 1904, under this by-law $135.52 was omitted to be credited this drain account. The error has now been corrected.

Under by-law 605, of 1909, on report of F. W. Flater, with provision for repair, this drain was repaired.

The first levy to meet debentures was credited in 1909, to the drain account. The debenture has not been paid. The amount has now been charged the drain account and credited debenture redemption account, against which account all debentures when paid should be charged and not mixed up with the drain accounts.

Leonard Drain.

Under by-law 119, in 1887, on report of W. G. McGeorge, with provision for repair, this drain was improved.

Under by-laws 390 and 398, of 1901, $108.30 was levied to cover overdraft.

Under by-law 464, December 5th, 1904, on report of A. McDonnell, without provision for repair, this drain was repaired.

Under by-law 553, October 21st, 1907, $444.84 was levied, spread over three years to cover overdraft.

Little Bear Creek Drain.

Originally constructed under by-law of October 13th, 1869.

Under by-law 95, July 7th, 1886, outlet was improved and extended, on report of W. G. McGeorge, with provision for repair. The work included the construction of 10 bridges in the Townships of Chatham and Dover East, and repair of two bridges in Dover East.

Under by-law 232, November 3rd, 1893, on report of W. G. McGeorge, with provision for repair, this drain was improved and a dam placed in the Prince Albert Road Drain, at Maxwell Creek, and otherwise improved to enable the water to flow south to Little Bear Creek Drain. Dover Township paid $479.97 in 1894, and Camden Township $700.00 in 1894, and $240.10 in 1897.

Under by-law 235, November, 16th, 1893, amount of engineer's assessment was reduced from $33,457.00 to $23,000.00, reducing the Chatham Township assessment under original by-law 232, from $31,459.72 to $21,627.00.

Under by-law 554, October 21st, 1907, $2,915.40 was levied to cover overdraft to be contributed as follows:

Chatham Township	$2,804 79
Camden Township	71 95
Dover Township	38 66

Under by-law 591, December 23rd, 1908, $1,491.54 was levied to cover overdraft to be contributed as follows:

Chatham Township	$1,402 20
Camden Township	57 92
Dover Township	31 12

Since 1897, neither Dover or Camden have paid anything on amending by-laws towards the maintenance of this drain. The amounts due from them should be collected.

In 1909 three orders were issued in payment of work and material for bridge over Little Bear Creek at Chatham and Dover Townline as follows:—

April 8, 1909, A. Williston	$ 145 00
April 17, 1909, McNairnie Bros.	134 60
April 24, 1909, A. Williston	25 38

These were all charged up to townline account. Entry has now been made charging them to the drain and crediting general funds.

The overdraft, also amounts due from other townships, should be promptly looked after.

Louisville Tap Drain.

In 1879 under by-law raising $2,900.00, this drain was improved from the 3rd Con. road to the Chatham and Camden Townline on report of A. McDonnell with provision for repair. Camden Township was assessed to contribute $1,340.00,

this by arbitration was reduced to $725.00 and an amending by-law passed in 1880 making the assessment against lands and roads in Chatham Township $2,500,00.

Under by-law 189, Oct. 5, 1891, on report of J. C. McNabb with provision for repair, this drain was improved.

Under by-law 392, of 1901, $188.74 was levied to cover overdraft.

Under by-law 487, August 7, 1907, on report of W. G. McGeorge with provision for repair, this drain was repaired and improved by placing a dam to prevent waters east of Big Creek cut off from flowing west in Big Creek. The Township of Camden to contribute $39.00 towards the cost. This amount has not yet been paid by Camden.

Maxwell Creek Drain.

Originally constructed under by-law 59, Sept. 23, 1884, on report of A. McDonnell with provision for repair, with outlet into Prince Albert Tap Drain.

Under by-law 394, in 1901, $103.17 was levied to cover overdraft.

Under by-law 557, Oct. 21, 1907, $206.34 was levied to cover overdraft.

Maxwell Creek Outlet.

Under by-law 576, provisionally adopted June 26, 1908, the report of Geo. A. McCubbin dated April 4, 1907, for construction of this drain was embodied in a by-law.

On March 7, 1910, Maxwell Creek Outlet drain by-law was provisionally adopted. It is to improve the drainage from Little Bear Creek at the Prince Albert Road by providing an outlet through Maxwell Creek westerly to Chenal Ecarte. The cost of construction to be borne as follows:—

Camden Township	$ 1,181 40
Chatham Township	37,376 56
Dover Township	5,456 68
	$44,014 64

The costs of the suit Dover vs. Chatham have not been ascertained. These are not included in statement of drain accounts unsettled between Dover and Chatham.

Meadows Drain.

Originally constructed under by-law 620, passed October 4, 1909, on report of F. W. Flater, with provision for repair.

No debentures were sold to provide funds for the work which was done in 1909.

Meadowvale Drain.

Under by-law 395, of 1901, $45.61 was levied to cover overdraft.

Under by-law 462, August 1, 1904, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The Engineer under Sub. Sec. 1, Sec. 9 M.D. Act, makes the upkeep of three bridges, two at the Fraser road and one at 15th and 16th Con. road a charge on the general funds of Chatham Township.

Meredith Drain.

Originally constructed under by-law 101, November 4, 1886, on report of W. G. McGeorge, with provision for repair.

Under by-law 338, December 15th, 1898, on report of W. G. McGeorge, to cover work done in 1896 and 1897, $578.88 was levied. Spread over five years. No debentures were sold for this.

Under by-law 597, Dec. 23, 1908, $40.52, was levied to cover overdraft.

Under by-law 639, December 6, 1909, on report of J. W. Shackleton this drain was improved with provision for repair.

Debentures have not yet been sold to provide funds to cover the overdrawn account for work done in 1909 under by-law 639.

Merritt Drain.

Originally constructed in 1875, under by-law 37 on report of A. McDonnell.

Under by-law 386, in 1901, $98.34 was levied to cover overdraft.

Under by-law 558, October 21, 1907, $250.56 was levied, spread over two years, to cover overdraft, of this only $208.72 was placed on the rolls.

Under by-law 629, October 4, 1909, $83.44 was levied to cover overdraft.

Miller Drain.

Constructed on report of J. W. Shackleton to the Township of Camden under by-law 6, May 27, 1873.

Under by-law 202, January 18, 1892, on report of Coad and Robertson to Camden Township with provision for repair, Chatham Township contributed $72.00 to repair this drain.

Under by-law 507, April 2, 1906, on report of J. W. Shackleton without provision for repair, to Chatham Township, this drain was repaired in Chatham Township on pro rata assessment without charging Camden Township at all for this repair.

The account is again overdrawn. This should be collected.

Miller and Leak Creek Drain.

Originally constructed, under by-law, August 15, 1881, on report of W. G. McGeorge, with provision for repair.

Under by-law 122, September 17, 1887, on report of W. G. McGeorge, with provision for repair, the drain was removed.

Under by-law 333, November 28, 1898, on report of W. G. McGeorge, without provision for repair, this drain was improved. The engineer under Sub. Sec. 1, Sec. 9 M.D. Act, made the upkeep of the following bridges a charge on the general funds of Chatham Township:—

Bridge at 12th and 13th Sideroad.
Bridge at 4th and 5th Con. Sideroad.
Bridge at 5th and 6th Con. Sideroad.
Bridge at 6th and 7th Con. Sideroad.
Bridge at 7th and 8th Con. Sideroad.
Bridge at 8th and 9th Con. Sideroad.
Bridge at Caledonia Road.

Under by-law 556, October 21, 1907, $1,360.13 was levied, spread over three years, to cover overdraft.

Mills Drain.

Originally constructed, under by-law 45 of 1876, on report of A. McDonnell.

Under by-law 121, in 1887, on report of W. G. McGeorge, with provision for repair, this drain was improved.

Under by-law 304, Sept. 25, 1897, on report of W. G. McGeorge, without provision for repair. The engineer under Sub. Section 1, Sec. 9 M.D. Act, makes the upkeep of the following bridges a charge on the General funds of Chatham Township.

Bridge at 12th and 13th Sideroad.
Bridge at 3rd and 4th Con. Road.
Bridge across Caledonia Road.
Bridge across Prince Albert Road.

Under by-law 513, June 4, 1906, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The engineer under Sub. Sec. 1, Section 9 M.D. Act, made the upkeep of bridges a charge on the general funds of Chatham Township as follows:—

Bridge at 12th and 13th Sideroad.
Bridge at 3rd and 4th Con. Road.
Bridge at Caledonia Road.
Bridge at Prince Albert Road.

Mills Extension Drain in Chatham Township.

Under by-law 490, September 4, 1906, on report of W. G. McGeorge, without provision for repair, to Chatham Township to improve this drain from Stake 0 to 13 in order to complete work done in Dover Township.

Mills Drain Extension in Dover.

Under by-law 248, Sept. 11, 1894, on report of W. G. McGeorge to Dover Township with provision for repair, Chatham Township contributed $434.00 toward the improvement of this drain.

Under by-law 489, September 4, 1905, on report of W. G. McGeorge, with provision for repair, to Dover Township, Chatham Township to contribute $659.00 towards the improvement of this drain. Dover Township were paid $152.00 too little on this, which must now be paid to them by Chatham Township.

The overdrafts in these accounts after paying the above amount should be collected.

McCouche's Creek Drain.

Originally constructed under by-law 366, Dec. 1, 1909, on report of W. G. McGeorge, without provision for repair. The engineer under Sub. Sec. 1, Sec. 9 M.D. Act, made the following bridges a charge on the general funds of Chatham Township:—

Bridge at Fraser Road Lot 5, Con. 17.
Bridge at 16th and 17th Con. Road at Lot 5.

Bridge at 3rd and 4th Sideroad (Fraser Road).
Bridge at 16th and 17th Con. Road at Lot 3.
Under by-law 630, Oct. 4, 1909, $63.71 was levied to cover overdraft.

McDonald Drain.

Originally constructed under by-law 36 of August 17, 1883.

Under by-law 200, Jan. 18, 1892, without report, on judgment rendered for damages to Miles McCarron this drain was repaired and improved.

McDonald Tap Drain.

Originally constructed under by-law 300, May 28, 1897, on report of W. G. McGeorge, with provision for repairs. Dover Township contributed $523.00. In his report the engineer under Sub. Sec. 1, Sec. 9 of M.D. Act, made the upkeep of bridge over highway a charge on the general funds of Dover and Chatham Townships one half each.

Under by-law 598, Dec. 23, 1908, $129.23 was levied to cover overdraft.

McDonald Tap Extension Drain.

Under by-law 309, Sept. 30, 1897, on report of W. G. McGeorge, without provision for repair, the McDonald Tap Drain was extended to the north side of Wagon Way of the 1st and 2nd Con. Roads in the Gore of Chatham Township. The Engineer under Sub. Sec. 1, Sec. 9 M.D. Act, made the upkeep of the bridge at 1st and 2nd Con. Road a charge on the general funds of Chatham Township.

Under by-law 559, Oct. 21, 1907, $96.47 was levied to cover overdraft.

McFarlane Drain in Dover.

Originally constructed in 1882, on report of W. G. McGeorge, to Dover Township, to which Chatham Township contributed $6,400.00. The engineer's report included $800.00 in his estimates for bridges.

Under by-law 210, August 8, 1892, on report of A. McDonnell to Dover Township, with provision for repair against which Chatham Township appealed and had their assessment reduced. Chatham Township contributed $2,186.26.

Under by-law of March 11, 1897, on an amending by-law of Dover Township to provide sufficient funds to carry out repairs and improvements to which Dover Township contributed $1,042.64 and Chatham Township under this by-law contributed $956.31.

Under by-law 468, Dec. 5, 1904, on report of A. McDonnell to Dover Township, Chatham Township contributed $1,745.74 to the improvement of this drain. In settlement of this there was paid Dover $1,701.29 in 1906.

This account is now overdrawn and should be collected.

McKim Drain.

Originally constructed under by-law 621, passed October 4, 1909, on report of W. M. Manigault to the Township of Camden, to which Chatham Township is to contribute $73.00. This has not yet been paid to Camden.

McLellan Drain of Sombra.

Originally constructed in 1886, on report of J. H. Jones to the Township of Sombra, under by-law 89, March 10, 1886, Chatham Township contributed $3,276.00.

Under by-law 241, March 15, 1894, on report of W. S. Davidson to Sombra Township with provision for repair, Chatham Township contributed $45.00 to the repair of this drain.

Under by-law 477, May 1st, 1905, on report of W. H. Flater with provision for repair to Sombra Township, Chatham Township to contribute $307.00. This drain was repaired. This has not yet been paid to Sombra.

Ninth Con. Drain.

Originally constructed under by-law 21, May 5th, 1874, on report of Walter Crowe.

Ninth Con. Imp. Drain.

Under by-law 353, November 10, 1899, on report of W. F. O'Hara, without provision for repair, the drain was improved from centre of Lot 2, west, with outlet into Sylvester Drain.

Ninth Con. Drain Lots 1 and 2.

Under by-law 482, July 24, 1905, on report of W. G. McGeorge without provision for repair, this drain was repaired. The engineer in his report made the upkeep of the bridge at 8th and 9th Con. Road a charge on the General funds of Chatham Township. There is one more levy to go on roll of 1910.

Under by-law 631, Oct. 4, 1909, $86.18 was levied to cover overdraft of account of by-law 352, occasioned by omission to place levy on rolls of 1902.

There are two 9th Con. Drains, both are short drains, they are so close together. Some of the members of the Council were not aware that there were two drains on the 9th Con. The map accompanying this report shows them clearly.

Norton Drain.

Under by-law 223, April 20, 1893, on report of Coad and Robertson to Camden Township, with provision for repair, Chatham Township contributed $48.00 to this drain.

In 1907, $15.00 was paid to Camden for upkeep which should be levied and collected.

Otter Creek Drain.

Originally constructed under by-law 34, passed in 1875, on report of J. W. Shackleton.

That part of the drain up to lot 15, in 3rd Con. Gore of Chatham where the Dobie drain has its outlet, has been repaired in the last few years. The amount of the overdraft should be collected.

Ouelette Drain in Dover.

Under by-law 150, August 21, 1889, on report of A. McDonnell to the Township of Dover, with provisions for repair, this drain which is the outlet of the 4th Con. Drain of Chatham Township was improved. The amount assessed against Chatham Township was $307.32.

Under by-law 322, May 19, 1898, on report of A. McDonnell, with provision for repair, this drain was improved, Chatham Township contributing $522.00.

Under by-law 536, October 21, 1907, on report of A. McDonnell, with provision for repair to Dover Township, Chatham Township contributed $1,619.26 to the improvement of this drain, after an appeal to the Referee which was settled before trial by agreement between the two townships by reducing assessment against Chatham Township to $1,619.26.

Under by-law 583, December 23, 1908, rate of interest in by-law 536 was raised to 5½ per cent.

There are two accounts, both overdrawn. These should be levied for without delay.

Paddy Drain.

Originally constructed under by-law 68 passed Nov. 9, 1878, on report of Walter Crowe.

By-law 105, December 23, 1886, raised $290.40 to clean out and repair on pro rata assessment.

In 1900 under By-Law 359, without provision for repair, on report of W. G. McGeorge, the drain was repaired and improved, Camden Township to contribute $35.00. The engineer in his report under Sub. Sec. 1, Sec. 9 M. D. Act, made the upkeep of the following bridges a charge on the general funds of Chatham Township.

Bridge at 4th and 5th Cons.

Bridge at 20th and 21st Sideroad.

Under by-law 633, October 4, 1909, $403.65 was levied, spread over two years, to cover overdraft, of which $201.83 will go on the 1910 roll and will cover the overdrawn account.

Camden Township have never paid the $35.00, their portion of by-law 359 of 1900.

Parrott Drain.

Originally constructed in 1881, on report of W. G. McGeorge, with provision for repair.

Under by-law 310, Dec. 10, 1897, on report of W. G. McGeorge, with provision for repair, the drain was improved from east side of 12th and 13th Sideroad to the Prince Albert Road, Camden Township to contribute $162.90. The engineer made the upkeep of bridge over the drain at 12th and 13th side road under Sub. Sec. 1, Sec. 9 M.D. Act, a charge on the General funds of Chatham Township.

Under by-law 560, Oct. 21, 1907, $191.97 was levied to cover overdraft, Camden Township was not charged with any portion of this.

Under by-law 596, Dec. 23, 1908, $59.44 was levied to cover overdraft.

Pinafore Drain.

Originally constructed by Sombra Township on report of J. H. Jones in 1878, with provision for repair. After arbitration Chatham Township contributed $375.00.

Under by-law 195, Nov. 25, 1891, on report of McGeorge and Flater, with provision for repair, that part of this drain in Chatham Township was improved. The waters of Pinafore Drain in Sombra Township were cut off by the construction of the Whitebread drain.

Under by-law 561, October 21, 1907, $200.33 was levied, spread over three years to cover overdraft.

Pike Creek Drain, South Branch.

Under by-law 505, April 2, 1906, on report of J. W. Shackleton, with provision for repair to Camden Township, Chatham Township to contribute $311.50 towards this drain as amended by the Referee.

This drain account is overdrawn and should be collected.

Pike Creek Drain, North Branch.

In 1878 under by-law 67, on report of J. W. Shackleton to Township of Camden, the creek was deepened and the drain constructed.

Under by-law 199, Jan. 18, 1892, Chatham Township contributed $34.10 under the name of Pike Creek and Robinson Drain to improve this drain on report of Coad and Robertson to Camden Township.

Under by-law 506, April 2, 1906, on report of W. G. McGeorge, with provision for repair, to Chatham Township, this drain in the Gore of Chatham Township was improved. Camden Township is to contribute $297.00. This has not yet been paid.

Pollock Drain.

Originally constructed under by-law 16, Nov. 15, 1882.

Under by-law 165, July 31, 1890, on report of McGeorge and Flater, with provision for repair, the drain was improved.

Under by-law 317, April 12, 1898, on report of W. G. McGeorge, without provision for repair. In his report the engineer provided for a barrier against the waters of the Townline Extension Drain and provided new outlet into Little Bear Creek Drain. The engineer under Sub. Sec. 1, Sec. 9 M.D. Act, makes the upkeep of following bridges a charge on the general funds of the Township of Chatham:—

Bridge at 9th and 10th Con. Road.

Bridge at 10th and 11th Con. Road.

Under by-law 634, October 4, 1909, $49.98 was levied to cover overdraft.

Prince Albert Road Tap Drain.

Originally constructed under by-law of August 19th, 1879, on report of A. McDonnell, with provision for repair. Camden Township contributed to the construction of this drain.

Prince Albert Road Drain North of Maxwell Creek.

Under by-law 316, April 12, 1898, on report of W. G. McGeorge, without provision for repair, the drain was repaired and improved. The engineer under Sub. Sec. 1, Sec. 9 M.D. Act, made the upkeep of the following bridges a charge on the general funds of the Township of Chatham.

Bridge at 14th Con. Road.
Bridge at 15th Con. Road.
Bridge at 16th Con. Road.
Bridge at Baseline Road.
Bridge at 2nd Con. Road.

Under by-law 594, December 23, 1908, $359.97 was levied to cover overdraft.

Under by-law 632, Oct. 4th, 1909, $166.77 was levied to cover overdraft.

There were a number of items disbursed on that part of the Little Bear Creek Drain on the Prince Albert Road, south of the Maxwell Creek, and charged to this account in error. These have now been corrected.

Purdie Creek Drain.

Under by-law 125, Oct. 27, 1887, on report of W. G. McGeorge, with provision for repair, this drain was repaired and extended.

Under by-law 406, Dec. 16, 1901, $315.13 was levied to cover overdraft.

Under by-law 510, April 2, 1906, on report of W. G. McGeorge, without provision for repair, this drain was repaired. The Engineer under subsection 1, section 9 Municipal Drainage Act, made the upkeep of bridges a charge on the general funds of Chatham Township as follows:—

Bridge at 4th and 5th Con. road.
Bridge at 5th and 6th Con. road.
Bridge at 6th and 7th Con. road.
Bridge at 7th and 8th Con. road.
Bridge at 8th and 9th Con. road.

Purdie Drain.

Originally constructed on the 9th Con., under a by-law in 1881, on report of W. G. McGeorge, with provision for repair. As there are two other 9th Con. drains this should always be described as Purdie Drain.

Under by-law 193, Oct. 28, 1891, $825.00 was levied without report of Engineer to repair this drain.

Under by-law 498, Dec. 4, 1905, on report of W. G. McGeorge, without provision for repair, this drain was improved.

Rice Drain.

Originally constructed under by-law 40, Oct. 15th, 1883, on report of W. G. McGeorge.

On May 4th, 1903, A. McDonnell made report on repair of this drain, which was appealed against on Aug. 7, 1903, the report was abandoned, as it was agreed that most successful drainage for lands assessed was to 13th Con. drain.

The overdrawn account includes $65.89, an old balance from 1891. This overdraft should be taken up by the council and collected in accordance with arrangement made in 1903, when the proposed improvement was abandoned.

Roe Drain.

Under by-law 335, Nov. 28, 1898, on report of W. G. McGeorge, without provision for repair, this drain was improved. The Engineer, under subsection 1, section 9, Municipal Drainage Act, made the following bridges a charge on the general funds of Chatham Township:—

Bridge at crossing of 4th Con. road.

Bridge at 22nd and 23rd sideroad.

Runciman Drain.

In 1878, under by-law 72, Chatham Township contributed $55.00 to Camden Township to construct this drain under report of J. W. Shackleton.

Under by-law 481, July 24, 1905, on report of A. Smith, without provision for repair to Camden Township, Chatham Township contributes $404.00 to improve this drain, which account was settled with Camden in 1905.

Second Con. Drain.

Under by-law 290, Feb. 9, 1897, on report of A. McDonnell, to Dover Township, with provision for repair, Chatham Township contributed $131.69 towards the improvement.

Under by-law 329, Sept. 6, 1898, on report of W. G. McGeorge, without provision for repair, to Chatham Township Council, this drain was improved, the City of Chatham contributing $58.50.

Under by-law 439, Oct. 2, 1905, on report of W. G. McGeorge, with provision for repair, Chatham Township contributed $95.48 to the improvement of this drain.

The overdraft should be collected.

Shaw Drain.

Originally constructed by Camden Township, on report of A. Smith, without provision for repair, dated July 20th, 1898, in which Chatham Township was assessed $34.00. On Jan. 8, 1900, Chatham Township issued an order to Camden Township for $30.76 for this drain, and again in April, 1907, $20.00 for maintenance. No by-law has ever been passed to collect these amounts, for which the drain account is still overdrawn. The assessment against lands and roads in Chatham Township is as follows:

S. half N. half Lot 24, Con. 7, D. Shaw	$14 50
Half assessment Townline	19 50
	$34 00

This should be collected.

Simpson Drain.

Originally constructed under by-law 56, June 9th, 1877, on report of W. G. McGeorge.

By-law 126, Oct. 27, 1887, on report of W. G. McGeorge, with provision for repair, improved and repaired the drain.

Under by-law 399 of 1901, $181.19 was levied to cover overdraft. Half this amount only was collected on roll of 1901.

Under by-law 453, Nov. 2, 1903, on report of W. G. McGeorge, without provision for repair, this drain was improved, the engineer, under subsection 1, section 9, Municipal Drainage Act, makes the upkeep of the following bridges a charge on the general funds of Chatham Township:

Bridge at Caledonia road.

Bridge at 7th and 8th Con. road.

Bridge at 8th and 9th Con. road.

Sixteenth Con. Drain.

Originally constructed under by-law 75 of 1876, on report of A. McDonnell, at a cost of $650.00.

Skinner Drainage Works.

Originally constructed under by-law 47, Dec. 21, 1883, at a cost of $21,475.00, on report of W. G. McGeorge of Nov. 6, 1883. This included the building of a pumping house, flume, sluice, and the erection of a wheel for discharging water, with a boiler and engine and all necessary connections to run the pumping machinery by steam. The drain and pumping works to be kept in repair and maintained by Municipality and lands in the same relative proportion as for construction. This was amended by report of W. G. McGeorge, Dec. 18, 1883, making the upkeep of the pumping works a flat rate per acre against lands.

On Feb. 18, 1887, by-law 110, $1,079.17 was raised on report of W. G. McGeorge, with provision for repair. An embankment was made from about the line of road between the 2nd and 3rd Con. of the Gore of Chatham to the high ground on the South side of Running Creek by dredging from margin of Sydenham River and bottom of Running Creek and the construction of a floodgate at the South side of Running Creek.

On Oct. 8, 1894, by-law 251, $5,192.00 was raised on report of W. G. McGeorge. Repairs were made to the small drains and public bridges connected therewith, and the dredge cut from the Pump Works to its upper end at 4th and 5th Con. Road deepened.

On March 11, 1897, by-law 293 was passed to raise $2,426.34 to cover overdrawn account.

On March 8, 1899, by-law 342, $4,062.00 was raised on report of A. McDonnell, with provision for repair, to provide a new outlet from the front of 3rd Con. to the Chenal Ecarte on the west side of the 5th and 6th Sideroad, and shortening the bridge at 3rd Con. to 30 feet by filling the aproaches by earth when dredging. The Engineer states, "I make no provision for flood gate at present time."

On Oct. 5, 1903, by-law 447, called "The Skinner by-law, 1902," on report of W. G. McGeorge, without provision for repair, $12,361.49 was raised to cover overdraft of $1,641.04 and repair all minor drains, and part of the dredge cut near the pumping station, to provide new boilers, centrifugal pumps and repair engines. In his report the engineer, under subsection 1, section 9, Municipal Drainage Act, makes the upkeep of the following bridges a charge on the general funds of the Township of Chatham:—

Bridge at 5th and 6th sideroad.
Bridge at 3rd and 4th Con. road crossing.
Bridge at 2nd and 3rd Con. road crossing.

On Oct. 21, 1907, by-law 563 to raise $3,337.60 to cover overdraft of Skinner, 1902, account was spread over 7 years. There are four more years in each of which $597.87 is to be collected, namely 1910, 1911, 1912, 1913.

Skinner Outlet.

Under by-law 636, Oct. 4, 1909, $918.27 was levied, spread over two years, to cover overdraft in Skinner Outlet account. Of this $459.13 is to be collected in 1910, which will cover this account.

The expenditures in 1909 and 1910 in improving the pumping scheme are to be provided for by by-law.

Under the original pumping scheme the expense of pumping was to be levied pro rata equally on all the acreage in the Scheme.

In June, 1907, Wm. Murphy wrote the council that the dredge cut shuts him off entirely from the Skinner drain, and requesting part Lot 1, Con. 4, Gore of Chatham, to be released entirely from the Skinner drain and he will arrange his own drainage. This letter was read at Council meeting, July 3, 1907. The minutes do not make any comment on the letter further than that it was read. Since 1906 no collection has been made against 45 acres, Lot 1, Con. 4, Gore, for pumping, nor for 50 acres, N. part Lot A, Con. 3. The Clerk states he was instructed by the Council without resolution to omit the above lands in the levy on 1907 and subsequent rolls.

The Council or officials of the township have no power to release any land from taxes imposed by an engineer's report.

The cost of pumping is placed on the roll annually without a special by-law pro rata, according to the acreage. Up to and including the 1906 roll the acreage assessed was 5,358 acres, but for 1907 and every year since only 5,263 acres have been levied against.

Action should be taken to collect from the lands omitted or to have them excluded from the scheme in a legal way.

J. W. Smith Drain.

Originally constructed by Camden Township on report of Angus Smith, without provision for repair, dated July 18, 1898, in which Chatham Township was assessed $56.00. On Jan. 8, 1900, Chatham Township issued an order to Camden Township for $50.31 for this drain. No by-law has ever been passed to collect the amount against the lands and roads in Chatham Township. This drain account has been overdrawn ever since. The assessment against lands and roads in Chatham Township is as follows:

N. eighth Lot 24, Con. 6, J. Kendall	$15 00
S. half N. quarter Lot 24, Con. 6, E. Bolton	3 00
S. third N. three-eighths Lot 24, Con. 6, Mrs. Wise	3 00
Part N. eighth and E. half N. half Lot 24, Con. 6, S. Section	1 25
Half Assessment Townline	33 75
	$56 00

This must be levied for without further delay.

Stephens and Henson Drain.

Originally constructed by Camden Township on report of Richard Coad, to which Chatham Township contributed $80.50 under by-law 97, August 31, 1886.

There was a suit between Dresden and Camden to which Chatham Township was made a party. In 1903 Dresden was paid $21.42, Chatham Township proportion of repair of this drain.

This amount should be collected.

Frederick Stephens Drain, Lots 1 and 2, Con. 7.

Originally constructed under by-law of 1881, on report of W. G. McGeorge, with provision for repair, to drain Lots 1, 2 and 3, Con. 7, into Creek at Townline.

Under by-law 151, Sept. 21, 1889, on report of McGeorge and Flater, with provision for repair, the drain was improved.

Under by-law 328, Sept. 6, 1898, on report of W. G. McGeorge, without provision for repair, the drain was improved.

Under by-law 483, July 24, 1905, on report of W. G. McGeorge, without provision for repair, the course of this drain was diverted into the Townline Extension Relief Drain in Lot 1, Con. 7.

Stephens Drain.

Under by-law 311, October 29, 1897, on report of A. Smith, to Camden Township, with provision for repair, Chatham Township contributed $142.25 to the improvement of this drain.

Under by-law 532, August 5, 1907, on report of F. W. Flater, with provision for repair to Chatham Township, this drain was improved. Camden Township to contribute $370.82.

Under by-law 587, Dec. 23, 1908, rate of interest in by-law 532 was increased to 5½ per cent.

Under by-law 606, 1909, on report of W. M. Manigault, without provision for repair, to Camden Township, Chatham Township contributes $120.00 to the repair of the Stephens drain in Camden, which has its outlet in the Chauncey drain in Camden, into the Stephens drain in Chatham Township with outlet in Little Bear Creek.

Collections under this by-law are to be made in 1910, 1911, 1912 and 1913. Camden have not been paid the $120.00.

Stone Drain.

Originally constructed under by-law August 27, 1881, on report of W. G. McGeorge, from Prince Albert Road Tap Drain at the Base Line easterly along the North side 282 rods and along the South side of the Base Line 330 rods to the line between Lots 23 and 24 in the 1st Con., Gore of Chatham, and terminates on the South side of the Base line.

Under by-law 407, Dec. 16, 1901, $291.55 was levied to cover overdraft.

Under by-law 562, October 21, 1907, $126.76 was levied to cover overdraft.

The levy in 1902, under by-law 407, was collected but never placed to the credit of the drain account. This has now been corrected.

Sylvester Drain.

Originally constructed under by-law 59, Sept. 12, 1877, on report of A. McDonnell.

Under by-law 140, Sept. 28, 1888, on report of McGeorge and Flater, with provision for repair, the drain was improved.

Under by-law 351, Nov. 10, 1899, on report of W. G. McGeorge, without provision for repair, this drain was improved. The engineer under subsection 1, section 9, Municipal Drainage Act, made the upkeep of the following bridges a charge on the general funds of Chatham Township:

Bridge at road between 6 and 7 Con.
Bridge at road between 7 and 8 Con.
Bridge at road between 8 and 9 Con.
Bridge at road between 9 and 10 Con.
Bridge at road between 10 and 11 Con.

Under by-law 635, October 4, 1909, $230.72 was levied to cover overdraft.

Taylor Avenue Covered Drain.

Originally constructed under by-law 191, October 5, 1891, on report of J. W. Shackleton, with provision for repair.

Under by-law 388 in 1901, $189.00 was levied to cover overdraft.

Under by-law 564, October 21, 1907, $210.00 was levied to cover overdraft.

Repairs were made on this drain in 1909 by the Commissioner without report. This should be collected promptly.

13th Con. Drain East of P. A. Road.

Under by-law 9, July 6th, 1882, on report of W. G. McGeorge, with provision for repair, the drain was improved.

Under by-law 289, Feb. 9th, 1897, on report of W. G. McGeorge, with provision for repair, this drain was improved from the Prince Albert Road to the Glasgow drain. To this Camden Township contributed $20.00 in 1899.

Under by-law 613, July 5, 1909, on report of J. W. Shackleton, with provision for repair, the drain was improved. Camden Township to contribute $187.72. Debentures have not been sold to provide for this expenditure, but when they are sold and the amount collected from Camden the drain account will not be overdrawn.

13th Con. Drain West of P. A. Road.

Under by-law 187, Sept. 7, 1891, on report of McGeorge and Flater, with provision for repair, this drain was improved.

Under by-law 446, Sept. 7, 1903, on report of A. McDonnell, without provision for repair, this drain was improved.

Under by-law 449, of 1903, $184.30 was levied on account of overdraft.

Turrell Drain.

Originally constructed under by-law, June 23, 1880, on report of A. McDonnell, with provision for repair.

Under by-law 106, Dec. 23, 1886, $300.00 was raised to clean out and repair on a pro rata assessment.

On Dec. 15, 1892, by-law 218, $70.67 raised for repair on pro rata assessment.

On Dec. 16, 1901, by-law 410, $402.83 was levied to cover overdraft.

On October 21, 1907, by-law 565, $317.10 was levied, spread over two years, to cover overdraft.

Tweddle Drain.

Originally constructed in 1876 under by-law 49, on report of A. McDonnell.

Under by-law 321, May 19, 1898, on report of W. G. McGeorge, without provision for repair, the drain was improved. The engineer, under subsection 1, section 9, Municipal Drainage Act, makes the upkeep of the following bridges a charge on the general funds of the Township of Chatham:

Bridge at 2nd Con. road.

Bridge at 25th and 26th sideroad.

Under by-law 595, Dec. 23, 1908, $103.60 was levied to cover overdraft.

Watson and Baseline Drain.

Under by-law 323, May 19, 1898, on report of A. Smith, to Camden Township with provision for repair, the drain was improved, Chatham Township contributing $216.85.

Under by-law 567, Oct. 21, 1907, on report of J. W. Shackleton, to Camden Township, Chatham Township to contribute $76.60 to repair this drain in Camden Township. This was spread over two years. The first was on the roll of 1907. The second levy has not been placed on roll for collection as the account already had a credit balance.

Under by-law 569, Dec. 2nd, 1908, on report of F. W. Flater to Chatham Township, with provision for repair, this drain was improved in Chatham Township, Camden Township to contribute $207.00. This was settled with Camden in 1908.

Wells Drain.

Originally constructed under by-law in 1874, on report of A. McDonnell.

Under by-law 186 of 1891, on report of McGeorge and Flater, with provision for repair, the drain was improved.

Under by-law 638, Dec. 6, 1909, on report of J. J. Newman, this drain to be improved, Camden Township to contribute $13.00, this has not yet been paid. No debentures have yet been issued to provide funds for amounts disbursed in 1909.

Wells Drain New Outlet.

Under by-law 574, April 6, 1908, on report of J. W. Shackleton, with provision for repair, this drain was repaired, Camden Township to contribute $83.25. A new outlet was made into the Parrott drain across Lot 12, at the line between Lots 11 and 12, Con. 12. This was settled with Camden in 1908, they paying $32.77.

Whitebread Drain.

Originally constructed under by-law of October 14, 1881.

Under by-law 331, October 19, 1898, as by-law of Feb. 27, 1894, was quashed on appeal to the Supreme Court of Canada by Judgment of that Court, dated Nov. 10, 1897, and Chatham Township was ordered to complete the drain and pay costs of action of Sombra Township and Peter Murphy and of appeals, $16,034.78 was raised by sale of debentures, the amount to be repaid by the levying annually for ten years, $1,976.94 on all the rateable property in the Township of Chatham.

The Whitebread drain account was charged with costs in connection with suit. Entry has been made charging all the items of costs to general funds, crediting the drain account in accordance with the Referee's judgment which directed that the costs should be out of the general funds of the township.

In 1901 there was charged $6,512.14 to general funds and the drain account credited. After this entry was made the drain account was still overdrawn $1,220.02. This amount and all items for repair to drain and bridges have accumulated in the account without any amending by-law to collect the overdraft.

The damages and plaintiff's costs of suit were ordered paid at the rate of $1.00 from Sombra to 83¼ cents from Chatham Township. Under by-law 637, Dec. 6, 1909, $2,789.98 was levied to pay damages and costs. Sombra have paid $1,535.18, their portion, and $1,267.48, Chatham's portion, is spread over five years.

The drain account is overdrawn $3,329.91. After debentures are sold under by-law 637 and credited the drain account, it will still be overdrawn $2,062.43.

Immediate action should be taken to straighten out the balance, $2,062.43. It should be taken up with the Township solicitor and not be allowed to drag on from year to year without any action being taken.

Whitebread Tap Drain.

Originally constructed under by-law 527, May 29, 1907, on report of F. W. Flater without provision for repair to Sombra Township. This drain is a continuation of Grape Run in Sombra Township crossing the townline at Lot 4, continuing to the blind line in Con. 4, Gore of Chatham, and continuing along the blind line westerly across lots 3, 2, 1, A and B to Chenal Ecarte with embankments on both sides from townline to the railway and a tunnel under the drain at lot 4, Con. 4. Chatham Township appealed against the assessment and the referee reduced it by $263.00. The Provincial Government granted $4,000.00 towards this work, which was divided pro rata, reducing the assessment against Chatham Township to $8,168.04, which is provided for under by-law 527. This drain is overdrawn, which should be levied for without delay.

Conclusion of Reference to Drains.

From what has been said regarding the different drains it must be very clear to everyone that the drainage accounts were mixed. A glance at the map which accompanies this report will show how easily they became so, and the amount of care that must be used to prevent a repetition of this in the future. There are not less than 100 Municipal drain accounts at the present time in the treasurer's ledger.

There are a number of drains in the township, constructed many years ago, parts of which have since come under engineer's reports with a different assessment covering part of the original area. New drains have since been constructed that have changed the course of water that came to the original drain, but the original part of the drain not repaired or improved by an engineer's report since is still assessed against the lands and roads under which it was constructed. Although some of those lands do not now use the original drain as an outlet or derive any benefit, yet repairs are to be paid for by those originally assessed. The only way this can be remedied is by new survey and assessment. The following will illustrate this:—

Skinner Drainage by the construction of the Whitebread Tap Drain.

Part of the old Campbell drain outlet from the blind line of Lot 6, Con. 9, to the outlet in Little Bear Creek on the Prince Albert Road is not now used. This drain is now into the Campbell Henderson Outlet.

The map of Municipal drains will enable the ratepayers and members of Council to intelligently discuss the matter of repair, improvement or new construction of drains. Had such a map existed prior to this audit a considerable amount of expense would have been saved to the township. Every year there are changes in the municipal drains. The courses of old drains are altered or new ones are constructed, so that it will be necessary that such changes be recorded on the map from time to time to keep it continually up to date.

There are a large number of Municipal drain accounts in the treasurer's ledger. A few of these will be covered by the sale of debentures; the remainder, where the overdraft is more than a few dollars or the drain is not soon again to be improved or repaired, should be collected by amending by-laws.

I must impress upon the Council the importance of beginning at once to pass by-laws to collect these overdrafts. Some of them are large and will require to be spread over a number of years. To ease the burden of the ratepayers these should provide for the sale of debentures to recoup the general funds. Owing to the amount of extra work this will throw on the clerk preparing, figuring and completing so many amending by-laws, in order to promptly sell your debentures and recoup the general funds, and place the levies on the roll, it will be absolutely necessary that immediate action be taken to place the levies on the 1910 roll. Before the amounts are filled in amending by-laws, a statement should be furnished by the treasurer of the balances in his ledger, as there are charges to some of the drains in 1910 not included in this report, which is up to Dec. 31, 1909.

Award Drains.

The Clerk, when placing collections on the roll for Award Drains and Agreements, omitted to add seven per cent., in accordance with Secs. 27 and 30 of the Ditches and Watercourses Act. The Clerk states that this is following the custom that has always been maintained. Such action by the Clerk or the Council is not legal, as the Act is very clear that seven per cent. is to be added.

There were a few credit balances for Award drains, principally amounts allowed by the engineers for clerks' fees. The Clerk gets a lump sum annually for this service. The items were not charged the Award drain accounts. These have now been closed out into the general funds of the township.

Accounts with Other Townships.

No accounts with other townships have been kept in the Treasurer's ledger to indicate what money is due to or from the Township of Chatham.

The settlements for drainage levies and work on townline has frequently been done verbally or on figures made at the time and not retained or filed with the Clerk. There should be a written report of all settlements, which, after being reported to the Council, should be filed with the Clerk for future reference. The absence of these reports does not enable making claims for some amounts that may be due the township.

There are four townships, Dover, Camden, Sombra and Dawn, with which there are drainage accounts; all four townships are in debt to Chatham, as shown in attached schedules. Amounts were overlooked by the old methods of bookkeeping and should have been collected before. If proper accounts and entries had appeared in the ledgers the amounts due from other townships would not have been delayed, but settlement insisted on. Entries have not been made in the Treasurer's ledger for sums due from these municipalities. Owing to the fact that some of them have remained so long unsettled they are disputed. In connection with some of the items there are appeals before the Referee; for that reason no entries have been made for any of the items due to or from other townships and comment on these further than the schedules in which they are detailed is not advisable.

The schedules of amounts contained in the engineer's reports due to or from other townships simply state the amount to be contributed; there will be deductions for publication of by-law and clerks' fees as allowed by the engineer. Interest has not been computed on these items. When settlement is made it must not be overlooked.

I cannot point out too strongly the importance of adjustment of accounts with other townships more promptly, and a written report of all settlements reported to Council, embodied in the minutes and filed with the Clerk, so there will be a record in writing of the transactions, and not have to rely on the memory of some official or member of Council.

The township of Dawn claim $109.00, less $10.00 for fees and publishing by-law on Chatham, Dawn, Sombra and Camden townline drain. No record of this appears in the books of Chatham Township.

Treasurer's Books and Accounts.

The Treasurer keeps the regular Government cash book, debenture register, arrears of tax record and ledgers. No journal has ever been kept.

The ledger balance of Dec. 31, 1909, is contained in this report.

Some of the drainage accounts were mixed in the Treasurer's ledger, but for this he should not be blamed. The manner in which orders were drawn on many of the drain accounts, the Treasurer was not furnished with copies of by-laws to help him in this work; these, together with the absence of a proper map to show where drains were located, what part of a drain each different by-law covered, where more than one by-law on drains by the same name, are to a great degree accountable for the condition in which the drainage accounts were found.

The drain accounts have all been gone over and analyzed, also about fifteen thousand vouchers. Those in reference to bridges, for which engineer's report made the maintenance a charge to the Municipality in whole or part, have been

gone over with the commissioner or member of Council who issued them, when it was possible to procure the persons who issued the orders and get that information. The corrections made in the accounts in the Treasurer's books are based on the engineer's reports, by-laws, the laws governing the municipalities, written legal opinions, and the evidence taken under oath from the officials directly responsible for, or familiar with, the orders issued on any accounts about which any question had been raised or errors discovered. Owing to the lack of information on orders many charges to drain accounts for repair to bridges have remained against the drains when the commissioners or councillors could not locate the bridge upon which the expenditure was made.

The debenture books are kept written up to date, which record the particulars in regard to the issue and maturity, with amounts of principal and interest, date of maturity and when paid.

The arrears of tax record is compared yearly with the books of the County Treasurer.

I cannot impress too strongly the importance of the Treasurer keeping collections for to meet debentures and the debenture payments out of the drain accounts.

Commissioners.

The Commissioners of divisions have exercised the power and authority of issuing orders for the payment of repairs to roads, drains, bridges, expended in their division. This has been the practice for years by the members of every Council and no particular Council is to blame for this. It is wrong and exceeds any powers the members of the Council possess.

The Commissioners of a road division legally have power only when appointed by by-law to expend the amount appropriated for their divisions. Any charges for bridge, drain, or other repairs, other than charged to road division account, must be passed by the Council, and orders when authorized by the Council should have the signature of the Reeve and Clerk, to indicate that they have been passed by Council before they are presented to the Treasurer or bank for payment.

Reeves have no legal authority to issue orders before the items are passed by the Council, unless as commissioner on a drain or division when appointed by by-law.

In a number of instances the Commissioners of the Township have expended money on drains on the side of the road adjoining other townships. This is wrong and a loss to the township. This is a matter which should be carefully watched.

The present Council and officials are not to blame for the system that exists. What is done now and the way it is done has been evolved out of what was done long years ago. In some things it has not kept pace with the times or other municipalities in the country.

No notice of orders issued is sent to the Treasurer; he issues very few cheques or orders on the bank himself, and without notice of orders issued is without any control over the funds or knowledge of how the bank account stands, without inquiring at the bank as to the condition of the account, and does not know then what orders are outstanding. There is no check kept on the Commissioner, who is given an order book, is not under bond, and may issue orders as he pleases, to whoever he pleases, without reference to anyone. The stubs of order books are not turned in to the Clerk, but are retained by those who issue the orders.

Without the record of what orders had been issued, it is found impossible to ascertain all the liabilities of the township.

Accounts should be presented in writing in detail for all services for which members of the Council are paid. At the last meeting of the Council each year all members of the Council should present statement, showing in detail of the services performed and the amount due. These, when passed on and orders issued for payment, should be filed with the Clerk.

Salaries and Remuneration of Councillors and Officers.

There is no by-law fixing the remuneration of members of the Council.

The remuneration now paid is $2.00 a day and mileage for Council meetings and committee work, and $2.00 a day without mileage for commission work.

It is not the custom to render detailed written statements for services attending Council or for any other services. Lump sum statements are rendered in writing for attendance at Council meetings, Committee work and for Commission on drains, etc.

Matters of Policy.

I received a number of suggestions and complaints from ratepayers in regard to the action of the Council in matters of policy, such as:

Assessment for drainage purposes not being just.

Errors by Engineers in assessing lands for drains.

Omissions to discover or correct errors in assessment or act on appeals at Court of Revision.

That some old matters which had been disposed of by Council be revived.

These have not been considered, as they are not within scope of an audit of this character.

Schools.

In conformity with my usual custom, the Secretary-Treasurer of each School Section in the township, for which taxes are levied, was requested to bring in the books and vouchers to be examined, to see that the amounts paid by the township, government and county grants and interest on school funds, passed through the books of the Section in the proper way.

The funds of a number of the sections are not kept in accounts in banks.

No mention of remuneration for Secretary-Treasurer is made in the minutes of the annual meetings of some of the sections. Sub-Section 4, Sec. 17, Public School Act, R.S.O. 1897, reads: "The Secretary or Secretary-Treasurer may be allowed such compensation for his services or for attending to the repairs of the school house or premises as shall be agreed upon by resolution of the annual meeting, duly entered in the minutes."

No remuneration can be legally claimed unless the minutes comply with the above.

All interest on school funds should be paid into the school account and a fixed sum paid the Secretary-Treasurer as remuneration for services.

In most sections vouchers and accounts are destroyed after the annual meeting. These should be retained.

Bonds of school officials are very seldom asked for: in fact it is the exception to the rule when an official is under bonds.

In some sections payments are made to trustees for services and material furnished. This is not regular.

More care might be exercised in the recording of transactions in the minutes in nearly all of the school sections, to the advantage of the ratepayers. In a number of instances pages are missing from minute and cash books.

School Section (1).

Bank account kept.
Interest credited.
Remuneration of Secy.-Treas., authorized, $10.00 yearly.

School Section (2).

Bank account kept.
Interest credited.
Remuneration of Secy.-Treas., authorized, $10.00 yearly.

School Section (3).

Bank account from Dec., 1907, presented.
Interest of 1908 and 1909 not entered in Cash Book, amounting to $1.67.
Remuneration of Secy.-Treas., authorized, $10.00 yearly.

School Section (4).

No bank account kept.
Remuneration of Secy.-Treas. authorized for 1906, continued at same amount since, $10.00 yearly.

School Section (5).

Bank account kept.
No interest credited since 1905 in Cash Book.
Secy.-Treas. remuneration, authorized, $15.00 yearly.

School Section (6).

Bank account kept.
Interest credited.
Wm. Lamb remunerated $15.00, minutes Dec. 29, 1909.

School Section (7).

No bank account kept for the section.
No interest credited.
Secy.-Treas remunerated, $5.00 yearly.

School Section (8).

No bank account kept in name of section and no interest credited to section.
Secy.-Treas remunerated, $5.00 yearly.

School Section (9).

Bank account kept.
Interest credited.
Secy.-Treas. remunerated, $5.00 yearly.

School Secton (10).

Bank account kept.
Interest not credited in Cash Book. It is stated that Secy.-Treas. receives interest instead of other remuneration. This should be discontinued and the Secy.-Treas. properly paid, as interest amounts to less than $5.00 a year.

School Section (11).

No bank account kept for section.
No interest credited.
Secy.-Treas. remunerated, $5.00 per year.

School Section (12).

No bank account kept for Section.
No interest credited.
Secy.-Treas. remunerated, $5.00 per year.

School Section (13).

No special Bank Book produced.
No interest credited to Section through Cash Book.
Secy.-Treas. remunerated $10.00 yearly, authorized at Trustee's meeting.

School Section (17).

No bank account kept for Section.
No interest credited.
Secy.-Treas. remunerated, $5.00 per year.

School Section (18).

No bank account kept for Section.
No interest credited since 1906.
Secy.-Treas. remunerated, $5.00 per year.

Union School Section (1), Chatham and Camden.

Bank account kept.
Interest credited.
Secy.-Treas. remunerated, $10.00 per year.

Union School Section (2), Chatham and Camden.

Bank account kept.
Interest credited.
Secy.-Treas. remunerated, $10.00 per year.

Union School Section (15) Chatham and Dover.

Bank account kept.
Secretary-Treasurer paid $5.00 yearly.

Union School Section (16 and 5).

No bank account kept.
No interest credited.
Secretary-Treasurer remunerated $10.00 per year.

Statute Labor.

The pathmaster of each division into which the township is divided is exempt from statute labor by virtue of his office and remunerated by payment of $1.00 per year on the return of his list properly certified.

The manner in which the matter of statute labor tax and pathmasters' exemption is carried on in the township is unjust and should be promptly rectified. One pathmaster may be exempted from paying statute labor tax on an assessment of one thousand dollars, while another may be exempted from ten thousand dollars for performing the same duties. This is not fair to all the ratepayers.

It would be in the interest of the township if the statute labor tax were collected on the rolls, from all alike, except what has been commuted, according to the assessment, and the whole sum expended by not more than four ratepayers, one for each division, and the money expended on the roads in the division in which it is contributed. The commissioner who expends it should be directly responsible to the ratepayers for its use to the best advantage of all in the division.

By doing away with the performing of statute labor work and placing the amount on the roll to be collected, the main purpose for which pathmasters were appointed ceased to exist.

All other money than statute labor tax raised on the tax roll should only be expended by the Council as a whole.

Debentures on Drains.

These are not issued and sold to provide funds for repair, improvement or new construction work under engineer's reports, as pomptly as they should be. The delay is not necessary nor in the interest of the township. For all the work done on drains in 1908 and 1909 the debentures of only one drain have been sold.

Bonds.

The bonds of the treasurer are in order, also those of the collectors of taxes for the two divisions.

As a Result of This Audit.

The Treasurer's ledger is corrected to Dec. 31, 1909, in accordance with the statement which appears in this report. The drain accounts are shown after correcting entries have been made.

By drawing the attention of the Council and urging the collection of taxes and return of 1909 rolls, the taxes are now in very much better shape than they have been for years.

The map of the Township which shows all municipal drains on it should be used by the members of the Council and Commissioners on drains. It would prevent a repetition of many errors which have occurred in the past. It is for that purpose that it is provided.

Financial Position of the Township.

By reference to the asset and liability statement it will be seen that the finances of the Township are in better shape than they have been for years.

Included in the assets is over $26,000.00 of overdrawn drain accounts. These are not available till debentures are sold and in a number of instances nothing can be done until amending by-laws are passed to collect the amounts.

If the tax rolls of 1909 are returned in the month of May, 1910, a vast improvement will be obtained as a result of this government audit.

The overdrawn drain accounts and accounts due from Dover, Dawn, Sombra and Camden townships should have the immediate attention of the members of the Council, and not allowed to drag on any longer without collection being made.

This is of vital importance, as by delay the township may sustain considerable loss.

Recommendations.

That the exempted property in the township be detailed at the back of the assessment roll, with valuation, for reference.

That the collectors return the rolls before April 8th, with statement of uncollected taxes, and settlement with the Treasurer recorded in the back of the roll, with duplicate of arrears for County Treasurer and the Clerk.

That notices be sent to all persons who have taxes in arrears, Sec. 147, Asst. Act, and return made to the County Treasurer.

That all reports of committees be in writing, incorporated in the minutes of Council, and filed with the Clerk.

That the Treasurer enter in the ledger accounts the voucher number of each charge when posting from the cash book.

That Collector's settlements with Treasurer for roll appear in roll, also arrears of taxes statement.

That Collectors enter in rolls the date on which money is received for each item in rolls. It is not sufficient to simply mark "paid."

That the matter of exemption of pathmasters and the manner of the expenditure of statute labor taxes be remedied. If the beats were done away with and statute labor expended in the division in which it is raised, by a member of Council in each division, it would be better for the township.

That all orders issued by Commissioners of divisions be reported in writing each month at the first meeting of the Council in the next month and recorded in the minutes.

That Commissioners issue orders only on their division appropriations, unless specially appointed by by-law.

That amending by-laws be passed to collect from ratepayers deficits on drain accounts as shown in this report.

That steps be taken to collect from Dover, Dawn, Sombra and Camden townships amounts shown in attached statements.

That the treasurer puts no levies to meet debentures through drain accounts in future, but enters all debenture levies and payments through Debenture Redemption Account. In this way the drain accounts will always show their actual condition.

Conclusion.

The absence of some vouchers, records, accounts and documents, and no journal kept by the Treasurer, covering years over which this audit extended, has caused time to be occupied that would have otherwise not been necessary. All papers and documents in connection with the affairs of the township were asked for, some of which were missing and were not produced. This report is based on such information, records, papers and documents as were produced, information procured from officials, members of the Council, ratepayers, by correspondence and conversation and evidence taken under oath. Accounts have had to be analyzed in detail, for awards, school sections, drains and other accounts for the years covered; necessitating the examination of over thirty ratepayers under oath regarding accounts; an enormous amount of work in separating the items charged to the different accounts. This all had to be done before a conclusion could be reached. There were irregularities, but only those of the greatest importance are referred to in this report.

I desire to call attention of the Council to the fact that the affairs of the township during the year 1910 are being conducted in a similar manner to that of former years, and that, owing to the methods of carrying on the business regarding the bridges over drains and other expenditures, unless the books are annually audited by some competent person, who will go thoroughly into each drainage by-law and account, a great deal of benefits derived from the expense of this audit will be lost to the township.

The officials of this township are fairly remunerated in comparison with those of other townships in proportion to the work done. I have never found a township Clerk or Treasurer overpaid for services in connection with the duties of his office, when properly performed.

Accompanying this report are:—

(*a*) Ten copies of a map made during this audit, for the use of the officials, on linen backed paper. On it are shown all the municipal drains, a different color for each different part of the drain, with the by-law number. This map will be a benefit to the municipality for years to come, to direct where changes should be made.

(*b*) A journal for the use of the Treasurer, in which have been made all corrections in accounts found in the audit.

It is unfortunate that the affairs of the township in connection with the townships of Dawn, Sombra, Camden and Dover have been allowed to run so long, and accounts be mixed in the manner in which they were found at the time of this audit.

The General Funds account will, if carefully examined, indicate to some extent the amount of work in this audit, and the condition in which the accounts were kept. There were over two hundred items charged to other accounts in error, which it was necessary to charge this account to make the corrections.

If the engineer's reports on drains and the amounts to be contributed by the General Funds for bridges are closely watched in the future, the general funds

will not have to contribute so much to roads and bridges account for the upkeep of over 100 bridges, marked on map, which the general funds have to maintain in whole or part.

The officers have performed their work as they were instructed. It is the system, not the officials, which is to be blamed for the manner in which the affairs have been conducted.

With so many drains, there cannot be too much care exercised to keep the accounts correct. The importance of the Council passing and directing to what accounts all orders issued for repairs to drains and bridges should be charged cannot be too strongly drawn to your attention.

If the by-law number which appears on the map was placed on the orders for payment of drain accounts, it would be an advantage. Some drains have a similarity of names; there is the Purdie Drain and Purdie Creek Drain and there are two 9th Con. Drains, three drains with Stephens or Stephan, there are two Wells Drains, a Campbell, a Henderson and Campbell Henderson Outlet.

The audit of the Township of Chatham and Gore is the second government audit in the Province in which I have found it necessary to make and furnish the township with a map of all the municipal drains in order that they may be able to properly direct to what account repairs or expenditures should be charged in the future.

I desire to thank the officers and members of Council for the willing manner in which they have rendered substantial assistance from time to time, during the continuance of the audit.

The attention of the Council is called to Section 14, Chater 228, R.S.O., 1897, which requires that the recommendations made in this report shall be carried into effect.

I shall be pleased to furnish any further explanation, or advise with the Council, in reference to any of the matters mentioned and recommendations contained in this report.

All of which is respectfully submitted,

F. Falls,

Chartered Accountant.

Chatham, Ont., May 3, 1910.

Schedule I.

STATEMENT OF DEBENTURES TO MATURE SUBSEQUENT TO DECEMBER 31, 1909.

By-law.	Year.	Drain.	Number Unpaid.	Amount. Principal and Interest.
327	1900	Indian Creek	1	$207.61
361	1900	Britton	1	64.75
366	1900	McCouche's Creek	1	196.46
368	1900	Townline Ex. Relief	1	421.41
369	1900	Big Creek West	1	629.90
377	1901	Chatham and Dover Townline	2	2,666.44
402	1901	Danforth	2	902.88
445	1903	Irving	4	523.72
446	1903	Thirteenth Con. West	4	1,294.52
447	1903	Skinner, 1902	4	6,403.52
453	1903	Simpson	4	466.20
464	1904	Leonard	5	654.65
465	1904	Bear	5	1,632.50
463	1904	Best	5	276.10
469	1094	Carleton E.	5	723.60
470	1904	Carleton W.	5	915.60
477	1905	McLennan	1	70.90
481	1905	Runceman	1	93.31
483	1905	Stephan	1	101.69
484	1905	Boyle Imp.	6	1,421.16
486	1905	Gray	6	4,302.90
487	1995	Louisville Tap	6	2,476.38
488	1905	Brown Imp.	6	1,680.90
489	1905	Mills Ex. Dover	2	304.42
492	1906	Brown Drain Dover	2	160.54
496	1906	Bissell	2	211.32
497	1906	Blackburn	7	541.31
498	1906	Purdie or 9th Con.	7	711.48
499	1906	Everitt Creek	7	863.66
505	1906	Pike Creek, S. Branch	2	143.90
506	1906	Pike Creek, N. Branch	2	146.26
508	1906	Davis	7	551.88
510	1906	Purdie Creek	7	2,394.21
512	1906	Campbell H. Outlet	7	5,031.04
513	1907	Mills Imp. 1907	8	4,364.64
514	1906	Johnston	2	325.54
515	1906	15th Con. Drain	7	892.01
520	1907	Fauser Imp.	3	595.92
521	1907	Centre Road South	3	260.61
527	1907	Whitebread Tap	3	8,462.40
531	1907	Keifer	3	167.88
532	1907	Stephan's Creek and Camden	3	185.10
533	1907	Henderson	8	1,061.28
535	1907	Boyle No. 2	3	643.92
536	1907	Ouellette	8	1,718.56
537	1907	Fourth Con.	8	3,037.44
569	1907	Watson and Base Line	3	777.00
574	1908	Wells No. 2 Outlet	9	1,558.08
				$63,237.50
		SCHOOLS AND OTHER DEBENTURES.		
420	1902	Tupperville Bridge	4	$4,403.16
452	1902	School Sec. 9	4	1,813.08
517	1906	School Sec. 7	7	1,396.08
				$7,612.32

Schedule I.—Continued.

TILE, STONE AND TIMBER DRAINAGE DEBENTURES.

609	1909	R. E. Ripley	20	$100	7.36 yearly
610	1909	Mrs. E. A. Paling	20	200	14.72 "
608	1909	Chas. Hassen	20	200	14.72 "
611	1909	Allen E. McKay	20	200	14.72 "
612	1909	J. Hall	20	100	7.36 "
				$800	

DEBENTURE REDEMPTION ACCOUNT.

Schedule II. December 31, 1909.

Britton Drain.	10th Collection for Debentures, only 9 Debentures charged....	$64 75
Chatham and D. Town L.	9th Collection for Debentures, only 8 Debs. charged	1,333 22
Fauser Drain.	3rd Collection for Debentures, only 2 Debentures charged	198 64
Hazlett Drain.	1st Collection for Debentures, no Debentures paid	199 33
Lafferty Drain.	1st Collection for Debentures, no Debentures paid	115 90
		$1,911 84

AMOUNTS LEVIED TO MEET DEBENTURE COUPONS.

Tile, Stone and Timber Redemption on 1909 *Tax Roll.*

R. E. Ripley	$7 36
Emma A. Paling	14 72
Chas. Hassen	14 72
Allen McKay	14 72
Jacob Hall	7 36
	$1,970 72

DRAINAGE ACCOUNTS.

Schedule III. December 31, 1909.

Drain.	By-law.	Dr.	Cr.
		$ c.	$ c.
1. Adkin	353	.....	1 43
3. Base Line West	461	.....	5 78
5. Bear	465	.....	09
7. Bedford Elliss	.....	8 90	.....
9. Best	463	16 84	.....
11. Big Creek E. of Cut Off	270	.....	2 65
13. Big Creek West	369	125 64	.....
15. Big Creek Outlet	291	.....	148 47
17. Bissell	496	.....	112 18
19. Blackburn	497	.....	122 37
21. Bolton	425	96 25	.....
23. Boyle	484	184 71	.....
25. Boyle	535	40 71	.....
27. Britton	361	87 72	.....
29. Brown	488	.....	177 32
31. Burgess	213	115 44	.....
33. Campbell	393	10 80	.....
35. Campbell Henderson Outlet	512	377 97	.....
37. Carleton West	470	.....	98 70
39. Carleton Cut Off	469	12 86	.....
41. Centre Road South	521	.....	22 09
43. Charteris	New	48 82	.....
45. Chatham and Dover Townline	377	1,638 09	.....
47. Chatham and Dover Townline Extension Relief	148	95 72	.....
49. Chatham and Dover Townline Extension Relief	368	.....	82 69

Schedule III.—Continued.

Drain.	By-law.	Dr.	Cr.
51. Ch. Camden, Dawn and Sombra Townline Drain	320	.....	3 29
53. Chinnick	350	.....	117 01
55. Churcher	603	.....	8 46
57. Danforth Creek	402	.....	80 80
59. Davis	508	.....	35 19
61. Dobie	378	1,356 73	.....
63. Dykeman	367	.....	41 69
65. Eberts Creek, Norton	299	25 07	.....
67. Everitt Creek	499	.....	43 32
69. Fauser	520	2,032 25	.....
71. Fenton	46	7 80	.....
73. 15th Con.	515	.....	209 89
75. 4th Con.	537	.....	48 12
77. Fraser	247	.....	44 50
79. French	305	53 02	.....
81. George	14	.....	1 25
83. Glasgow	334	.....	59 57
85. Gray	486	.....	13 72
87. Hardy	509	32 54	.....
89. Headley	448	.....	25 98
91. Henderson	533	.....	203 44
93. Hezlett	604	806 69	.....
95. Indian Creek	327	.....	79 83
97. Irving	445	30 55	.....
99. Jenkins	181	7 11	.....
101. Joiner	575	.....	56 90
103. Johnston	514	22 13	.....
105. Keifer	531	.....	24 00
107. Kerby	226	55 56	.....
107. Kerby Ward	186	.....	25 70
109. Leonard	454	.....	36 85
111. Lafferty	605	820 62	.....
113. Little Bear Creek	232	849 73	.....
115. Louisville Tap	487	22 16	.....
117. Maxwell Creek East	59	30 14	.....
119. Maxwell Creek Outlet	New	2,364 04	.....
127. Meadows	620	406 64	.....
129. Meadowvale	462	.....	75 60
131. Meredith	639	812 46	.....
133. Merritt	386	.....	1 86
135. Miller	507	37 86	.....
137. Miller and Leak Creek	333	.....	370 77
139. Mills	513	.....	33 24
141. Mills Extension	490	35 30	.....
141. Mills Extension Dover	489	.....	145 75
143. McCouche's Creek	366	.....	15 81
145. McDonald Tap	300	.....	58 79
145. McDonald Tap Extension	309	.....	91 94
147. McFarlane	468	84 38	.....
149. McKimm	621	22 00	.....
151. McLellan	477	.....	444 75
153. Ninth Con., Lots 1 and 2	482	.....	12 55
153. Ninth Con., Lots 2, 3 and 4	352	.....	1 83
155. Norton	223	15 00	.....
157. Otter Creek	34	429 27	.....
159. Ouellette	322	9 52	.....
159. Ouellette	536	76 99	.....
161. Paddy	359	111 53	.....
163. Parrott	310	.....	44 14
165. Pinafore	195	.....	25 49
167. Pike Creek, South Branch	505	25 82	.....
167. Pike Creek, North Branch	506	198 12	.....
169. Pollock	317	4 30	.....
171. Prince Albert Tap	316	.....	268 25
173. Purdie Creek	510	.....	71 47

Schedule III.—Continued.

Drain.	By-law.	Dr.	Cr.
175. Purdie	498	.....	248 93
177. Rice	40	233 64	.....
179. Roe	335	4 51	.....
181. Runciman	481	2 18	.....
183. 2nd Con. Dover	493	7 11	.....
183. 2nd Con.	329	54 36	.....
185. Simpson	453	.....	48 70
187. 16th Con.	75	.....	78 00
189. Shaw	.....	50 76	.....
191. Skinner Outlet	342	378 00	.....
193. Skinner Pump	.....	1,455 41	.....
195. Skinner Drain Works	447	4,698 50	.....
189. Smith J. W. Drain	.....	50 31	.....
197. Stephan	328	.....	10 99
199. Stephens, Camden	606	.....	3 46
199. Stephens Henson	97	20 92	.....
199. Stephens Chatham and Camden	532	4 35	.....
201. Stone	.....	.....	104 79
203. Sylvester	351	.....	269 36
205. 13th Con. West	446	.....	97 02
207. 13th Con. East	613	1,573 54	.....
209. Taylor Ave. Covered Drain	191	317 72	.....
211. Turrell	218	39 74	.....
213. Tweedle	321	.....	27 95
215. Watson Base Line	569	.....	70 07
217. Wells	638	405 27	.....
217. Wells Outlet	574	.....	325 22
219. Whitebread Tap	527	125 00	.....
221. Whitebread	331 & 637	3,329 91	.....
	.....	$26,397 03	$4,802 79

Schedule V.

LIST OF ARREARS IN COUNTY TREASURER'S HANDS, DECEMBER 31, 1909.

Folio			
96.	N.-West Pt. Lot 5, Little's Survey	$1 58	
99.	Lot 68, Sub-Div. Lot 13, Con. 1, Gore, Little's Survey	41	
102.	Pt. N.-W. Pt. Lot 11, Little's Survey	1 58	
134.	S.-W. Pt. S.-E. ¼ Lot 16, Con. 10	8 76	
137.	Lots 79, 80, 81, and 82, Little's Survey, Con. 1, Gore	2 91	
			$15 24

ARREARS OF TAXES COLLECTED BY COUNTY TREASURER FROM JULY 1, 1909, TO DEC. 31, 1909.

135.	W. ¼ S. ½ Lot 16, Con. 11, Geo. E. Weir	$20 89	
131.	N.-W. ¼ Lot 4, Con. 3, S. B. Arnold	28 07	
120.	N. ½ Lot 9, Con. 1, Gore, Huron, E. & L. S. Co.	119 42	
			$168 38

Not entered in Cash Book as on December 31, 1909.

Arrears of Taxes of 1908 Rolls not returned to County Treasurer as on April 16, 1910 ..... $282 04

$465 66

Schedule VIII.

STATEMENT OF UNSETTLED DRAINAGE ITEMS IN CONNECTION WITH TOWNSHIP OF DOVER EAST AND WEST.

By-Law No.	——	Due to Chatham Township	Due to Dover Township.
		$ c.	$ c.
409	Chatham and Dover Townline Ex. Drain, passed Dec. 16, 1901	94 32	.....
489	Mills Ex. Drain short payment to Dover, passed Sept. 4, 1905	.....	152 00
546	Chatham and Dover Townline Drain, passed Oct. 21, 1907	161 13	.....
554	Little Bear Creek Drain, passed Oct. 21, 1907	38 66	.....
566	Chatham and Dover Townline Ex. Drain, passed Oct. 21, 1907	61 58	.....
591	Little Bear Creek Drain, passed Dec. 23, 1908	31 12	.....
	Maxwell Creek, 1909 by-law, not finally passed	5,456 68	.....
	Little Bear Creek, Dover, 1903 bylaw, judgment June 29, 1904	.....	126 00
		$5,843 49	$278 00

This does not include any interest for delay in payment, nor does it cover drain accounts still overdrawn, for which amending by-laws have not yet been passed, to which Dover Township is to contribute according to the Engineer's report.

Schedule IX.

STATEMENT OF UNSETTLED DRAINAGE ITEMS IN CONNECTION WITH TOWNSHIP OF DAWN.

By-law No.	——	Due to Chatham Township.	Due to Dawn.
		$ c.	$ c.
543	Dobie Drain, passed Oct. 21, 1907	480 38	.....
	Chatham, Dawn, Sombra and Camden Townline Drain claimed by Dawn not in Chatham Township books	.....	109 00

This does not include interest for delay in payment, nor drain accounts overdrawn for which amending by-laws have not yet been passed, to which Dawn Township is to contribute according to the Engineer's report.

Schedule X.

STATEMENT OF UNSETTLED DRAINAGE ITEMS IN CONNECTION WITH CAMDEN TOWNSHIP.

By-law No.	——	Due to Chatham Township.	Due to Camden Township.
		$	$ c.
359	Paddy Imp. Drain, passed Mar. 1, 1900	35 00	.....
402	Danforth Repair Drain, passed Nov. 4, 1901	54 00	.....
487	Louisville Tap Drain, passed Aug. 7th, 1905	39 00	.....
506	Pike Creek, N. Branch, Drain, passed April 2, 1906	297 00	.....
554	Little Bear Creek Drain, passed Oct. 21, 1907	71 95	.....
591	Little Bear Creek Drain, passed Dec. 23, 1908	57 92	.....
604	Hazlett Repair Drain, passed April 5, 1909	103 00	.....
606	Stephens Repair Drain, passed April 5, 1909	.....	120 00
613	13th Con. East Drain, passed July 5, 1909	187 72	.....
621	McKim Drain, passed Oct. 4, 1909	.....	73 00
638	Wells Improvement Drain, passed Dec. 6, 1909	13 00	.....
	Maxwell Creek, 1910 by-law	1,181 40	.....
		2,039 99	193 00

This does not include any interest for delay in payment, nor does it cover drain accounts still overdrawn, for which amending by-laws have not yet been passed, to which Camden Township is to contribute according to the Engineer's report.

Schedule XI.

STATEMENT OF UNSETTLED DRAINAGE ITEMS IN CONNECTION WITH THE TOWNSHIP OF SOMBRA.

By-law No.		Due to Chatham Township.	Due to Sombra Township.
		$ c.	$ c.
477	McLellan Drain, passed May 1, 1905	.....	307 00
520	Fauser Drain, passed Oct. 13, 1906	277 99	.....
542	Burgess Drain, passed Oct. 21, 1907	101 52	.....
548	Dobie Drain, passed Oct. 21, 1907	834 44	.....
575	Joiner Drain, passed April 6, 1908	.....	224 00
603	Churcher Drain, passed April 5, 1909	.....	133 00
		1,213 95	664 00

This does not include any interest for delay in payment, nor does it cover drain accounts still overdrawn, for which amending by-laws have not yet been passed, to which Sombra Township is to contribute according to the Engineer's report.

Schedule XII.

FINANCIAL STATEMENT AS ON DECEMBER 31ST, 1909.

ASSETS.

Available Assets.

Taxes:			
1909 Roll, 1st Division	$22,837 31		
1909 Roll, 2nd Division	24,693 09		
County Treasurer, Arrears of Taxes	183 62		
1908 Arrears of Taxes not returned to County Treasurer	282 04		
		$47,996 06	
School Account overdrawn		39	
Drainage Accounts (See details Schedule 3)		26,397 03	
			$74,393 48
Fixed Assets.			
Town Hall			$2,500 00
			$76,893 48
Passive Assets.			
Debentures:			
Drainage		$61,325 66	
Tupperville Bridge		4,403 16	
Schools		3,209 16	
Tile, Stone and Timber Drainage		773 12	
			$69,711 10
			$146,604 58

LIABILITIES.

Current Liabilities.			
County of Kent, 1909, County rates		$5,136 26	
School Sections		2,087 95	
Statute Labour Divisions		1,423 81	
Debentures Redemption Account		1,911 84	
Tile, Stone and Timber Redemption Account		58 88	
Drainage Accounts		4,802 79	
Tile, Stone and Timber Account		9 00	
			$15,430 53
Canadian Bank of Commerce overdraft		$22,756 07	
Less credited back April 27, 1910		58 00	
			$22,698 07
			$38,128 60

Schedule XII.—Continued.

Deferred Liabilities.

Debentures:			
Drainage	$63,237 50		
Less	1,911 84		
		$61,325 66	
Tupperville Bridge		4,403 16	
School Sections		3,209 16	
Tile, Stone and Timber		773 12	
			$69,711 10
			$107,839 70
Assets exceed Liabilities			38,764 88
			$146,604 58

Schedule XIII. December 31, 1909.

TREASURER'S LEDGER BALANCE.

SCHOOL ACCOUNTS.

School Section No. 1	.....	.....	$14 74
" 2	.....	.....	14 58
" 3	.....	.....	9 72
" 4	.....	.....	29 39
" 5	.....	.....	9 14
" 6	.....	.....	7 52
" 7	.....	$0 39	.....
" 8	.....	.....	21 38
" 9	.....	.....	8 39
" 10	.....	.....	17 56
" 11	.....	.....	11 95
" 12	.....	.....	11 50
" 13	.....	.....	495 35
" 14	.....	.....	182 70
" 17	.....	.....	5 02
" 18	.....	.....	13 94
" 19	.....	.....	449 31
" 1 Union C. & C.	.....	.....	435 63
" 2 Union C. & C.	.....	.....	15
" 3 Union C. & C.	.....	.....	140 17
" 4 Union C. & C.	.....	.....	1 51
" 8 Union C. & C.	.....	.....	1 85
" 15 Union C. & D.	.....	.....	1 78
" 16 Union C. & S.	.....	.....	3 37
" 22 Union C. & C., D. & S.	.....	.....	201 30
		$0 39	$2,087 95

OTHER ACCOUNTS.

1908 Arrears of Taxes		$282 04	
County Treasurer, Arrears of Taxes		183 62	
Tile, Stone and Timber Account			$9 00
Statute Labour Divisions, Schedule IV.			1,423 81
Debenture Redemption Account. Schedule II.			1,911 84
Tile, Stone and Timber Redemption Account, Schedule II.			58 88
County of Kent, 1909, County Rate			$5,136 26
Collector of Taxes, 1st Division		$ 22,837 31	
Collector of Taxes, 2nd Division		24,693 09	
Canadian Bank of Commerce overdraft	22,756 07		
Less item credited back April 27, 1910	58 00		
			22,698 07
Fixed Assets		2,500 00	
General Funds			38,764 88
		$50,496 45	$72,090 69
Drainage Accounts, Schedule III.		26,397 03	4,802 79
		$76,893 48	$76,893 48

Schedule XIV.

STATEMENT OF LEDGER ACCOUNTS IN WHICH CHANGES WERE MADE DURING THIS AUDIT, SHOWING CORRECTIONS AND BALANCES ON DEC. 31ST, 1909, AFTER CORRECTIONS WERE MADE.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
ARNOLD DRAIN:				
Balance	16 46			
Written off to General Funds		16 46		
BASE LINE DRAIN WEST:				
Debit Balance	137 74			
Corrections.—Orders charged the drain for bridges to be maintained by the General Funds according to the Engineer's report.				
Dec. 2, 1901, S. Thibodeau, repair to bridge.		18 00		
Orders, May 6, 1902, W. Cooper, repair bridge		6 25		
" April 11, 1903, W. Cooper "		1 50		
" April 25, 1904, W. Cooper "		5 50		
" Oct. 1, 1904, D. Lucas "		18 00		
" Nov. 14, 1904, McDougal & Gordon, repair bridge		17 34		
" April 12, 1907, S. Thibodeau "		15 00		
" Sept. 16, 1907, McNairnie Bros. repair bridge		37 30		
" Nov. 11, 1908, McNairnie Bros. repair bridge		14 63		
" Nov. 9, 1908, D. Teeter "		10 00		
Credit Balance				5 78
BIG CREEK DRAIN WEST:				
Debit Balance	359 64			
Corrections of amounts.				
Short credit collected on rolls 1907 and 1908		129 62		
Orders charged the drain for bridges to be maintained by general funds according to the Engineer's report .				
Orders Sept. 3, 1904, S. Hadley Co., material for bridge		21 62		
Orders, April 27, 1904, G. Griffith, material for bridge		15 75		
Orders, Dec. 19, 1903, R. Lanigan, material for bridge		2 00		
Orders, Dec. 15, 1906, Hadley & Co., material for bridge		20 01		
Orders, Dec. 22, 1906, A. Coulter, material for bridge		45 00		
Debit Balance			125 64	
BIG CREEK CUT OFF:				
Credit Balance		156 47		
Corrections.				
Orders, May 2, 1906, charged Louisville Tap in error	8 00			
Credit Balance				148 47
BRITTON DRAIN:				
Debit Balance	34 97			
Corrections.				
Collection to meet debenture transferred Debenture R. Account	64 75			
Order, Dec. 29, 1899, on Brown Drain charged this drain in error		12 00		
Debit Balance			87 72	

Schedule XIV.—Continued.

—	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
BROWN DRAIN:				
Credit Balance	.....	$189 32	.....	.....
Order, Dec. 20, 1899, charged Britton Drain in error	12 00	.....	.....	.....
Credit Balance	.....	.....	.....	$177 32
CAMPBELL HENDERSON OUTLET DRAIN:				
Credit Balance	.....	11 34	.....	.....
Corrections.				
Balance Campbell Henderson transferred..	421 13	.....	.....	.....
Orders for bridges charged the drain to be maintained by general funds as per Engineer's report.				
Order, Aug. 4, 1908, J. Cooper, repair bridge	.....	7 26	.....	.....
" Sept. 2, 1908, J. Cooper "	.....	16 64	.....	.....
" Sept. 18, 1908, D. Vandusen "	.....	3 00	.....	.....
" Oct. 15, 1909, J. Dauphin "	.....	2 00	.....	.....
" Sept. 11, 1909, J. Dauphin "	.....	1 00	.....	.....
" July 17, 1908, J Cooper "	.....	1 92	.....	.....
Debit Balance	.....	.....	377 97	.....
CENTRE CREEK DRAIN:				
Credit Balance	.....	22 63	.....	.....
Corrections.				
Written off to general funds	22 63	.....	.....	.....
CHATHAM AND DOVER TOWNLINE DRAIN:				
Debit Balance	294 87	.....	.....	.....
Corrections.				
Levy to meet Debenture No. 9, not due till 1910, transferred to Debenture Redemption account	1,333 22	.....	.....	.....
Order Aug. 10, 1909, charged Townline account in error	10 00	.....	.....	.....
Debit Balance	.....	.....	1,638 09	.....
CHATHAM AND DOVER TOWNLINE EXTENSION RELIEF DRAIN:				
Credit Balance	.....	47 57	.....	.....
Corrections.				
Half of order, July 17, 1908, J. Cooper	.....	18 66	.....	.....
Half of order, Dec. 15, 1909, J. Cooper	.....	18 96	.....	.....
Order, July 28, 1909, W. Rosebury, charged to Townline account in error	2 50	.....	.....	.....
Credit Balance	.....	.....	.....	82 69
CHATHAM, DAWN AND SOMBRA T. L. DRAIN:				
Credit Balance	.....	6 00	.....	.....
Corrections.				
Transferred to C., C., D. and Sombra Drain..	6 00	.....	.....	.....
CHATHAM, CAMDEN, DAWN AND SOMBRA DRAIN				
Debit Balance	2 71	.....	.....	.....
Corrections.				
Transfer from C., D. and S. T. L. Drain	.....	6 00	.....	.....
Credit Balance	.....	.....	.....	3 29

Schedule XIV.—Continued.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
CHINNICK DRAIN:				
Debit Balance	141 94			
Orders charged the drain for bridges to be charged general funds as per Engineer's report.				
July 31, 1909, H. Morgan, repair bridge		3 50		
Jan. 8, 1908, McNairnie Bros., "		5 00		
Dec. 15, 1908, J. Owens "		20 00		
Dec. 25, 1908, J. Cooper "		28 00		
Oct. 2, 1902, C. Duddy, "		3 00		
Nov. 15, 1902, C. Duddy "		1 50		
Dec. 17, 1902, Hadley & Co., "		7 30		
Dec. 1, 1902, C. Duddy "		4 00		
May 9, 1903, J. Owens "		5 00		
Oct. 8, 1903, J. Stewart "		5 00		
Nov. 7, 1903, H. Shaw, "		4 00		
Dec. 24, 1903, Laird Bros. "		14 19		
July 9, 1904, D. Vandusen		7 75		
July 30, 1904, J. Seveers, repair bridge		2 00		
May 28, D. McDonald, "		4 00		
Oct. 19, 1904, C. Vandusen "		4 00		
Dec. 2, 1905, C. Duddy "		7 00		
Dec. 21, 1905, Laird Bros. "		9 22		
April 13, 1906, J. Owens "		15 50		
April, 1906, Hadley & Co. "		8 71		
April, 1906, Hadley & Co. "		11 00		
July 28, 1906, A. Moore "		15 00		
Sept. 30, 1906, A. Moore "		6 53		
Dec. 15, 1906, Hadley & Co. "		10 75		
Nov. 21, 1907, J. Owens "		35 00		
Dec. 18, 1907, J. Cooper "		22 00		
Credit Balance				117 01
DANFORTH CREEK DRAIN:				
Debit Balance	126 45			
Corrections.				
Orders charged the bridges to be maintained by general funds according to Engineer's report.				
Oct. 26, 1906, J. McKerrall, repair bridge		2 00		
Jan. 30, 1907, L. Higgs "		3 00		
April 29, 1907, J. Cooper "		4 16		
June 11, 1907, J. Cooper "		23 29		
June 12 1907, S. Smith "		10 00		
June 18, 1907, H. Hughes "		15 00		
Aug. 23 1907 L. Turner "		4 00		
Sept. 6, 1907, J. Cooper "		24 20		
Sept. 27 1907, W. Shaw "		6 00		
Nov. 20, 1907, J. Cooper "		19 58		
Dec. 17, 1907, J. Stewart "		7 00		
Nov. 25, 1908, J. Cooper "		8 84		
Nov. 26, 1908, J. Cooper "		28 64		
Dec. 4, 1908, H. Hughes "		8 00		
May 7, 1909, H. Morgan "		4 00		
Sept. 9, 1909, J. Cooper "		23 04		
Sept. 28, 1909, T. Shaw "		4 50		
Nov. 30, 1905, W. Bird "		10 00		
Dec. 9, 1905, W. Bird "		2 00		
Credit Balance				80 80
DAVIS DRAIN:				
Credit Balance		8 19		

Schedule XIV.—Continued.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
Corrections.				
Order charged the drain for bridges to be maintained by general funds as per Engineer's report.				
Dec. 18, 1906, G. McKerrall	.....	7 00	.....	.....
Dec. 17, 1906, P. McKerrall	.....	16 00	.....	.....
Aug. 27, 1907, H. Morgan	.....	4 00	.....	.....
Credit Balance	.....	.....	.....	35 19
DOBIE DRAIN:				
Debit Balance	1,456 73	.....	.....	.....
Corrections.				
Jan. 12, 1909, Order J. S. Fraser charged this drain in error	.....	100 00	.....	.....
Debit Balance	.....	.....	1,356 73	.....
DYKEMAN DRAIN:				
Credit Balance	.....	22 19	.....	.....
Corrections.				
Orders charged the drain for bridges to be maintained by general funds as per Engineer's report.				
Sept. 30, 1902, E. Bishop, repair bridge	.....	11 50	.....	.....
June 16, 1904, J. Bishop "	.....	2 00	.....	.....
June 27, 1905, E. Hewson "	.....	6 00	.....	.....
Credit Balance	.....	.....	.....	41 69
FAUSER DRAIN:				
Debit Balance	1,833 61	.....	.....	.....
Corrections.				
Collection to meet 3rd Debenture not due till 1910 transferred to Debenture Redemption account	198 64	.....	.....	.....
Debit Balance	.....	.....	2,032 25	.....
GLASGOW DRAIN:				
Debit Balance	56 90	.....	.....	.....
Corrections.				
Order, July 14, 1908, J. Cooper, charged in error.	.....	22 88	.....	.....
Orders charged this drain for bridges to be maintained by general funds as per Engineer's report.				
Dec. 22, 1900, W. Daly, repair bridge	.....	12 00	.....	.....
Dec. 7, 1901, W. Daly "	.....	15 00	.....	.....
Nov. 2, 1902, W. Tiffin "	.....	1 50	.....	.....
Sept. 10, 1903, W. Daly "	.....	11 75	.....	.....
Dec. 18, 1903, J. Cooper "	.....	10 99	.....	.....
Sept. 2, 1904, J. Cooper "	.....	13 59	.....	.....
May 2, 1907, W. Vance "	.....	2 00	.....	.....
Oct. 27, 1908, W. Daly "	.....	3 00	.....	.....
Oct. 7, 1908, J. Cooper "	.....	8 32	.....	.....
Oct. 18, 1909, Jas. Fritz "	.....	2 00	.....	.....
Dec. 3, 1909, J. Cooper "	.....	13 44	.....	.....
Credit Balance	.....	.....	.....	59 57
HEADLEY DRAIN:				
Credit Balance	.....	20 98	.....	.....
Corrections.				
April 3, 1907, S. Smith, repair bridge, should be general funds	.....	5 00	.....	.....
Credit Balance	.....	.....	.....	25 98

Schedule XIV.—Continued.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
HENDERSON DRAIN:				
Credit Balance		152 40		
Corrections.				
Orders charged the drain for bridges to be maintained by general funds as per Engineer's report.				
June 13, 1907, C. Vandusen, repair bridge		2 50		
June 28, 1907, C. Vandusen "		10 00		
July 3, C. Vandusen "		6 00		
July 22, C. Vandusen "		20 75		
Dec. 21, 1908, P. O. Dawson "		6 79		
Dec. 23, 1908, P. O. Dawson "		5 00		
Credit Balance				203 44
HAZLETT DRAIN:				
Debit Balance	616 36			
Corrections.				
Levy to meet Debenture No. 1 transferred to Debenture Redemption account	199 33			
Order Sept. 22, 1909, S. Smith, repair bridge, should be general funds		9 00		
Debit Balance			806 69	
JOHNSTON BEST DRAIN:				
Debit Balance	5 88			
Written off general funds		5 88		
LAFFERTY DRAIN:				
Debit Balance	840 24			
Corrections.				
Amount on Tax Roll, 1904, not credited drain account.		135 52		
Collected 1909 to pay Debenture No. 1, transferred to Debenture Redemption account	115 90			
Debit Balance			820 62	
LITTLE BEAR CREEK DRAIN:				
Debit Balance	475 45			
Corrections.				
Orders charged Prince Albert Tap in error.				
Feb. 13, 1899, J. McNaughton	5 00			
Aug. 1, 1899, S. Rogers	3 00			
Aug. 7, 1899, J. Cooper	15 60			
Dec. 5, 1901, J. Moore	6 00			
Oct. 2, 1908, A. Morton	3 50			
Oct. 7, 1908, J. Cooper	7 92			
Sept. 14, 1909, J. Cooper	5 28			
Sept. 14, 1909, A. Morton	3 00			
Feb. 2, 1907, J. Francis	2 00			
July 2, 1908, A. Milburn	8 00			
Orders charged Townline account on error.				
April 8, 1909, A. Williston, bridge over Little Bear Creek	145 00			
April 17, 1909, McNairnie Bros. bridge over Little Bear Creek	134 60			
April 24, 1909, A. Williston, bridge over Little Bear Creek	25 38			
Debit Balance			849 73	
LOUISVILLE TAP DRAIN:				
Debit Balance	30 16			

Schedule XIV.—Continued.

—	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
Corrections.				
May 2, 1906, J. Smith, should be Big Creek Outlet		8 00		
Debit Balance			22 16	
MAXWELL CREEK OUTLET:				
Debit Balance	2,264 04			
Corrections.				
Order, Jan. 12, 1909, charged Dobie Drain in error	100 00			
Debit Balance			2,364 04	
MAXWELL CREEK WEST:	92 26			
Written off general funds		92 26		
MANNING DRAIN:	26 00			
Written off general funds		26 00		
MILLER AND LEAK CREEK DRAIN:				
Credit Balance		146 78		
Corrections.				
Orders charged the drain for bridges to be maintained by general funds as per Engineer's report.				
Sept. 28, 1903, R. Steen, repair bridge		4 00		
Oct. 3, 1903, Hadley Co. "		9 45		
July 30, 1904, J. Seevers "		10 00		
Aug. 27, 1904, Hadley Co "		4 24		
Feb. 4, 1905, C. Vandusen "		10 00		
April 25, 1905, A. Vandusen "		3 00		
July 29, 1905, C. Vandusen "		5 00		
Aug. 12, 1905, D. Vandusen "		18 00		
Aug. 5, 1905, Blonde Co. "		37 00		
Dec. 5, 1905, C. Vandusen "		6 00		
April 9, 1904, W. Gray "		22 05		
March 10, 1906, C. Vandusen "		6 00		
April 13, 1906, J. Owens "		8 50		
April, 1906, Hadley Co. "		12 00		
June 9, 1906, C. Vandusen "		3 00		
Dec. 19, 1906, Hadley Co. "		6 42		
Dec. 22, 1906, C. Vandusen "		8 50		
Dec. 15, 1906, Hadley Co. "		8 10		
May 1, 1907, A. Vandusen "		10 00		
April 30, 1907, S. Hughston "		5 00		
Oct. 29, 1907, Hadley Co. "		8 32		
Nov. 23, 1907, Hadley Co. "		4 38		
Oct. 7, 1907, Hadley Co. "		11 88		
Nov. 13, 1909, J. Gray "		3 15		
Credit Balance				370 77
MILLS DRAIN:				
Credit Balance		7 74		
Corrections.				
Orders charged drain should be general funds as per Engineer's report.				
Oct. 28, 1903, Hadley Co.		2 21		
Oct. 28, 1903, Hadley Co.		4 22		
Nov. 8, 1903, S. Duncan		2 50		
Sept. 6, 1909, W. Drager		16 57		
Credit Balance				33 24
MCCOUCHE'S CREEK DRAIN:				
Debit Balance	7 69			

Schedule XIV.—Continued.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
Corrections.				
Orders charged the drain should be general funds.				
Dec. 10, 1904, T. Moreland, repair bridge....	.....	3 75	.....	.....
Sept. 27, 1905, G. Templeton "	.....	1 25	.....	.....
April 10, 1908, W. Moreland "	.....	10 25	.....	.....
Sept. 28, 1908, J. G. Templeton "	.....	4 25	.....	.....
Sept. 14, 1908, Jas. Anderson "	.....	1 50	.....	.....
Sept. 28, 1908, F. Asselstine "	.....	2 50	.....	.....
Credit Balance	.....	.....	.....	15 81
McDonald Tap Drain:				
Credit Balance	.....	3 59	.....	.....
Corrections.				
Orders charged drain for bridges should be general funds.				
Oct. 16, 1900, H. McLean, repair bridge	.....	5 25	.....	.....
July 13, 1901, T. Harper "	.....	5 25	.....	.....
Jan. 18, 1904, J. Price	.....	1 50	.....	.....
Aug. 25, 1904, A. Williston	.....	36 00	.....	.....
Sept. 11, 1905, J. Dunderdale	.....	2 90	.....	.....
July 23, 1906, J. Lucier	.....	1 80	.....	.....
Aug. 28, 1906, D. Stewart.....	.....	2 50	.....	.....
Credit Balance	.....	.....	.....	58 79
McDonald Tap Extension Drain:				
Debit Balance	50 82	.....	.....	.....
Corrections.				
Orders charged drain for bridges should be general funds.				
April 14, 1902, J. Armstrong, repair bridge...	.....	16 75	.....	.....
June 22, 1903, T. Harper " ...	.....	4 00	.....	.....
Aug. 13, 1904, D. Lucas " ...	.....	38 00	.....	.....
Sept. 15, 1906, McNairnie Bros. " ...	.....	44 00	.....	.....
Sept. 15, 1906, W. Armstrong " ...	.....	2 50	.....	.....
Sept. 16, 1907, McNairnie Bros. " ...	.....	2 91	.....	.....
Sept. 16, 1907, McNairnie Bros. " ...	.....	34 60	.....	.....
Credit Balance	.....	.....	.....	91 94
Paddy Drain:				
Debit Balance	181 29	.....	.....	.....
Corrections.				
Orders charged drain for bridges should be general funds.				
Nov. 30, 1901, A. Coulter, repair bridge....	.....	2 00	.....	.....
April 26, 1900, A. Coulter "	.....	11 00	.....	.....
Nov. 19, 1908, J. Cooper "	.....	30 96	.....	.....
Nov. 19, 1908, A. Coulter "	.....	16 00	.....	.....
Aug. 13, 1908, A. Coulter "	.....	9 80	.....	.....
Debit Balance	.....	.....	111 53	.....
Parrot Drain:				
Debit Balance	31 71	.....	.....	.....
Corrections.				
Orders charged drain for bridges should be general funds.				
Sept. 17, 1902, J. Moore, repair bridge....	.....	14 50	.....	.....
Nov. 30, 1902, Laird Bros. "	.....	28 89	.....	.....
Sept. 24 1903, B. Richardson "	.....	5 50	.....	.....

Schedule XIV.—Continued.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
Dec. 24, 1903, Laird Bros., repair bridge		7 92		
Oct. 6, 1908, J. Cooper "		8 80		
Oct. 3, 1908, T. Forshee		5 00		
Jan. 19, 1909, Laird Bros., repair bridge		5 24		
Credit Balance				44 14
PIKE CREEK DRAIN:				
Debit Balance	137 25			
Corrections.				
Old balance 1887, transferred general funds		82 00		
Transferred Pike Creek, North Branch		55 25		
PIKE CREEK, NORTH BRANCH:				
Debit Balance	142 87			
Corrections.				
Charged Pike Creek Drain in error	55 25			
Debit Balance			198 12	
PIKE DRAIN, SOUTH DRAIN:				
Debit Balance	45 82			
To general funds, costs as per Referee's decision		20 00		
Debit Balance			25 82	
PRINCE ALBERT TAP DRAIN:				
Debit Balance	1 31			
Corrections.				
The following were charged the drain, and should have been charged Little Bear Creek, South of Maxwell Creek.				
February 13, 1899, J. McNaughton		5 00		
Aug. 1, 1899, S. Rodgers		3 00		
Aug. 7, 1899, J. Cooper		15 60		
Dec. 5, 1901, J. Moore		6 00		
Feb. 2, 1907, J. Travis		2 00		
July 2, 1908, A. Milburn		8 00		
Oct. 2, 1908, A. Morton		3 50		
Oct. 7, 1908, J. Cooper		17 92		
Sept. 14, 1909, J. Cooper		5 28		
Sept. 14, 1909, A. Morton		3 00		
The following, charged the drain, should be general funds as per Engineer's report.				
Dec. 5, 1901, J. Moore, repair bridge		20 00		
May 4, 1903, J. Jenkins "		8 00		
May 13, 1904, J. Pool "		4 00		
July 14, 1904, T. Watson "		5 00		
May 31, 1905, C. Wade "		4 00		
Dec. 9, 1907, J. Jenkins "		10 00		
Dec. 21, 1907, McNairnie Bros. "		2 25		
Dec. 21, 1907, McNairnie Bros. "		8 61		
Dec. 21, 1907, W. H. Pool "		4 50		
Dec. 17, 1907, J. Cooper "		3 20		
Jan. 31, 1908, C. Wade "		3 00		
April 14, 1908, R. Parker "		12 00		
Jan. 19, 1908, J. Cooper "		27 24		
Aug. 14, 1908, C. Wade "		7 75		
Oct. 20, 1908, W. Bourne "		5 00		
Oct. 7, 1908, J. Cooper "		24 18		
Aug. 31, 1908, McNairnie Bros. "		22 40		
Aug. 31, 1908, McNairnie Bros. "		29 13		
Credit Balance				268 25

Schedule XIV.—Continued.

—	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
PURDIE DRAIN CREEK:				
Credit Balance		58 97		
Corrections.				
Orders charged drain for bridge should be general funds as per Engineer's report.				
Dec. 19, 1908, J. Owens, repair bridge		10 00		
Jan. 18, 1909, McNairnie Bros "		2 50		
Credit Balance				71 47
PURDIE DRAIN:				
Credit Balance		219 68		
Corrections.				
The following orders were charged Purdie drain in error; they were for bridges on Purdie Creek Drain, which should have been charged general funds as per Engineer's report.				
Dec. 12, 1907, G. Craven		1 25		
Nov. 26, 1908, J. Cooper		9 60		
Dec. 5, 1908, H. Crow		6 00		
Aug. 14, 1909, E. Overstreet		1 50		
Sept. 6, 1909, F. Ogeltree		10 90		
Credit Balance				248 93
SIMPSON DRAIN:				
Credit Balance		27 45		
Corrections.				
Orders charged drain should be general funds as per Engineer's report.				
Aug. 25, 1905, C. Vandusen, repair bridge		2 00		
Dec. 18, 1906, Hadley Co. "		8 40		
Dec. 22, 1906, C. Vandusen "		6 35		
Sept. 23, 1908, C. Vandusen "		2 50		
Sept. 18, 1908, B. Catton "		2 00		
Credit Balance				48 70
SKINNER OUTLET:				
Debit Balance	436 38			
Corrections.				
The following were charged this drain account in error instead of Skinner Drainage Works; they are now charged general funds as per Engineer's report.		44 50		
Sept. 8, 1906, McNairnie Bros., repair bridge V. 812, no date, McNairnie Bros. "		13 88		
Debit Balance			378 00	
SKINNER DRAINAGE WORKS:				
Debit Balance	4,947 50			
Corrections.				
Orders charged this drain which should be general funds as per Engineer's report.				
Jan. 26, 1909, A. Williston, repair bridge		245 00		
Nov. 18, 1909, W. Pears "		3 00		
Oct. 29, 1909, W. Goodman "		1 00		
Debit Balance			4,698 50	

Schedule XIV.—Continued.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
J. W. SMITH, DRAIN:				
Corrections.				
This amount was written off in error in 1907; is now corrected by charging drain.				
Debit Balance	50 31			
			50 31	
STEPHENS AND HENSON DRAIN:				
Debit Balance	26 42			
Corrections.				
Sept. 10, 1906, item charged in 1906 in error		5 50		
Debit Balance			20 92	
STEPHENS, CHATHAM AND CAMDEN DRAIN:				
Credit Balance		1 15		
Corrections.				
Sept. 10, 1906, G. Farmer, charged Stephens and Henson Drain in error	5 50			
Debit Balance			4 35	
STONE DRAIN:				
Debit Balance	2 27			
Corrections.				
Amount collected on 1902 tax roll not credited the drain		107 06		
Credit Balance				104 79
SYLVESTER DRAIN:				
Credit Balance		12 76		
Corrections.				
Orders charged the drain for bridges to be maintained by general funds as per Engineer's report.				
Aug. 26, 1904, I. Siddal, repair bridge		10 00		
Dec. 24, 1904, J. Malone "		6 50		
Sept. 20, 1904, Blonde Co. "		11 06		
Dec. 2, 1905, A. Strain "		2 50		
Dec. 15, 1906, S. Rodgers "		10 00		
Jan. 9, 1907, Blonde Co. "		11 37		
Jan. 26, 1907, W. Siddal "		2 00		
June 15, 1907, J. H. Vandusen "		11 00		
June 15, 1907, J. Cooper "		18 58		
June 28, 1907, J. H. Vandusen "		1 50		
July 25, 1907, J. W. Rosebury "		16 00		
Aug. 3, 1907, W. Siddell "		12 00		
Sept. 13, 1907, Blonde Co. "		25 09		
Sept. 21, 1908, J. Cooper "		17 36		
Sept. 15, 1908, J. H. Vandusen "		4 00		
Aug. 7, A. Strain "		20 00		
Dec. 21, A. Malone "		4 00		

Schedule XIV.—Concluded.

——	Debit.	Credit.	Dr. Balance.	Cr. Balance.
			After Corrections.	
Aug. 4, 1908, J. Coper "	.....	44 41	.....	.....
Aug. 15, 1908, McNairnie Bros. "	.....	3 75	.....	.....
April 6, 1908, Hadley Co. "	.....	25 48	.....	.....
Credit Balance	.....	.....	.....	269 36
THIRTEENTH CON. DRAIN EAST:				
Debit Balance	1,550 66	.....	.....	.....
Corrections.				
Order, July 14, 1908, for bridge charged Glasgow Drain in error	22 88	.....	.....	.....
Debit Balance	.....	.....	1,573 54	.....
TWEDDLE DRAIN:				
Debit Balance	39 45	.....	.....	.....
Corrections.				
Orders charged the drain for bridges to be maintained by general funds as per Engineer's report.				
Dec. 6, 1905, Jas. Moore, repair bridge....	.....	10 00	.....	.....
Dec. 16, 1905, McNairnie Bros. "	.....	16 20	.....	.....
July 14, 1908, J. Cooper "	.....	16 92	.....	.....
July 7, 1908, C. Daly "	.....	4 00	.....	.....
Oct. 7, 1908, J. Cooper "	.....	17 28	.....	.....
Sept. 11, 1908, A. Teeter "	.....	3 00	.....	.....
Credit Balance	.....	.....	.....	27 95
WHITEBREAD DRAIN:				
Debit Balance	4,878 14	.....	.....	.....
The following orders for costs in Whitebread suit now charged general funds as per judgment of referee, June 3, 1908.				
Nov. 5, 1905, H. Cummings, witness fees	.....	50 25	.....	.....
Dec. 2, 1905, W. G. McGeorge	.....	49 05	.....	.....
Dec. 4, 1905, A. McDonnell	.....	45 75	.....	.....
Dec. 15, 1905, F. Druer	.....	21 00	.....	.....
Dec. 4, 1905, N. G. Flater	.....	5 20	.....	.....
Jan. 24, 1906, W. Turner	.....	5 25	.....	.....
Feb. 7, 1906, W. G. McGeorge	.....	148 55	.....	.....
March 5, 1906, H. Winter	.....	43 40	.....	.....
Aug. 8, 1906, J. S. Fraser	.....	500 00	.....	.....
Dec. 3, 1906, G. A. McCubbin	.....	51 50	.....	.....
Feb. 4, 1908, J. S. Fraser	.....	628 28	.....	.....
Debit Balance	.....	.....	3,329 91	.....
COUNTY TREASURER ARREARS OF TAXES:				
Debit Balance	449 02	.....	.....	.....
Corrections.				
To adjust to actual amount in County Treasurer's hands, Dec. 31, 1909	.....	265 40	.....	.....
1908, Arrears of taxes not returned to County Treasurer as on April 16, 1910	282 04	.....	465 66	.....

TOWNSHIP OF CHATHAM AND GORE.

General Funds.

1909.
Dec. 31. Balance as shown in Treasurer's ledger $42,532 14

Corrections and Adjustments.

To Chinnick Drain:		
Order, July 3, 1909, H. Morgan, work on bridge....	$3 50	$3 50
To Danforth Drain:		
Order, Oct. 26, 1906, J. McKerrall, repair of bridge.	2 00	
" Jan. 30, 1907, L. Higgs, repair of bridge.....	3 00	
" April 29, 1907, J. Cooper, material	4 16	
" June 11, 1907, J. Cooper, material	23 29	
" June 12, 1907, S. Smith, repair of bridge	10 00	
" June 18, 1907, H. Hughes, repair of bridge	15 00	
" Aug. 23, 1907, L. Turner, repair to bridge	4 00	
" Sept. 26, 1907, Jno. Cooper, material	24 20	
" Sept. 27, 1907, W. Shaw, repair of bridge	6 00	
" Nov. 20, 1907, Jno. Cooper, material	19 58	
" Dec. 17, 1907, J. Stewart, repair of bridge	7 00	
" Nov. 25, 1908, J. Cooper, bridge material	8 84	
" Nov. 26, 1908, J. Cooper, bridge material	28 64	
" Dec. 4, 1908, H. Hughes, repair of bridge	8 00	
" May 7, 1909, H. Morgan, repair of bridge	4 00	
" Sept. 9, 1909, Jno. Cooper, repair of bridge ..	23 04	
" Sept. 28, 1909, T. Shaw, repair of bridge	4 50	
		195 25
To Davis Drain:		
Order Dec. 18, 1906, G. McKerral, repair of bridge ..	7 00	
" Dec. 17, 1906, Peter McKerral, repair of bridge	16 00	
" Aug. 27, 1907, H. Morgan, repair of bridge	4 00	
		27 00
To Paddy Drain:		
Order Nov. 19, 1908, J. Cooper, bridge material	30 96	
Voucher 67, no date, A. Coulter, repair of bridge	16 00	
Order, Aug. 13, 1908, A. Coulter, repair of bridge	9 80	
		56 76
To Purdy Creek:		
Order, Dec. 12, 1907, G. Craven, repair of bridge	1 25	
" Nov. 26, 1908, J. Cooper, bridge material	9 60	
" Dec. 5, 1908, H. Crow, repair to bridge.....	6 00	
" Aug. 14, 1909, E. Overstreet repair of bridge..	1 50	
" Sept. 6, 1909, F. Ogeltree, bridge material	10 90	
		29 25
To Hazlett Drain:		
Order, Sept. 22, 1909, S. Smith, repair of bridge	9 00	9 00
To Campbell Henderson Outlet:		
Order, Aug. 4, 1908, J. Cooper, matl. for rep. of bdge.	7 26	
" Sept. 21, 1908, J. Cooper, matl. for rep. of bdge.	16 64	
" Sept. 18, 1908, D. Vandusen, repair of bridge..	3 00	
" Oct. 15, 1909, J. Dauphin, repair of bridge....	2 00	
" Sept. 11, 1909, J. Dauphin, repair of bridge....	1 00	
		29 90
To Chinnick Drain:		
Order, Jan. 8, 1908, McNairnie Bros., material for repair of bridge	5 00	
" Dec. 15, 1908, J. Owens, repair of bridge.....	20 00	
" Nov. 25, 1908, J. Cooper, matl. for rep. of. bdge.	28 00	
		53 00
To McDonald Tap Drain:		
Order, July 23, 1906, J. Lucier, repair of bridge....	1 80	
" Aug. 24, 1906, D. Stewart, repair of bridge..	2 50	
		4 30

To McDonald Tap Extension Drain:		
Order, Sept. 15, 1906, McNairnie Bros., material for repair of bridge	44 00	
" Sept. 15, 1906, W. Armstrong, repair of bridge	2 50	
" Sept. 16, 1907, McNairnie Bros., material for repair of bridge	2 91	
" Sept. 16, 1907, McNairnie Bros., material for repair of bridge	34 60	
		84 01
To Parrott Drain:		
Order, Oct. 6, 1908, Jno. Cooper, matl. for rep. of bdge.	8 80	
" Oct. 3, 1908, T. Forshee, repair of bridge	5 00	
" Jan. 19, 1909, Laird Bros., matl. for rep. of bdge	5 24	
		19 04
To Purdie Creek Drain:		
Order, Dec. 19, 1908, J. Owens, repair of bridge	10 00	
" Jan. 18, 1909, McNairnie Bros., bridge material	2 50	
		12 50
To Skinner Outlet:		
Order, Sept 8, 1906, McNairnie Bros., bridge material	44 50	
Vou. 812, no date, McNairnie Bros., bridge material.	13 88	
		58 38
To Sylvester Drain:		
Order, Sept. 21, 1908, Jno. Cooper, material for repair of bridge	17 36	
" Sept. 15, 1908, J. H. Vandusen, repair of bdge.	4 00	
" Aug. 7, 1908, A. Strain, repair of bridge	20 00	
" Dec. 21, 1908, J. Malone, repair of bridge	4 00	
" Aug. 4, 1908, J. Cooper, matl. for rep. of bdge.	44 41	
" Aug. 15, 1908, McNairnie Bros., material for repair of bridge	3 75	
" Apl. 6, 1908, Hadley Co., matl. for rep. of bdge.	25 48	
		119 00
To Chatham and Dover Townline Ext. Relief:		
Half of order, July 17, 1908, J. Cooper, material for bridge, Con. 8, $37.32	18 66	18 66
To Chinnick Drain:		
Order, Oct. 8, 1902, C. Duddy, repair of bridge	3 00	
" Nov. 15, 1902, C. Duddy, repair of bridge	1 50	
" Dec. 17, 1902, Hadley Co., matl. for rep.of bdge.	7 30	
" Dec. , 1902, C. Duddy, repair of bridge	4 00	
" May 9, 1903, J. Owens, repair of bridge	5 00	
" Oct. 8, 1903, J. Stewart, repair of bridge	5 00	
" Nov. 7, 1903, H. Shaw, repair of bridge	4 00	
" Dec. 24, 1903, Laird Bros. matl. for rep. of bdge.	14 19	
" July 9, 1904, D. Vandusen, repair of bridge	7 75	
" July 30, 1904, J. Seevers, repair of bridge	2 00	
" May 28, 1904, D. McDonald, repair of bridge	4 00	
" Oct. 19, 1904, C. Vandusen, repair of bridge	4 00	
" Dec. 2, 1905, C. Duddy, repair of bridge	7 00	
" Dec. 21, 1905, Laird Bros., matl. for rep. of bdge.	9 22	
		77 96
To Glasgow Drain:		
Order, Dec. 22, 1900, W. Daly, repair of bridge	12 00	
" Dec. 7, 1901, W. Daly, repair of bridge	15 00	
" Nov. 2, 1902, W. Tiffen, repair of bridge	1 50	
		28 50
To Miller Leak Drain:		
Order, Sept. 28, 1903, R. Stein, repair of bridge	4 00	
" Oct. 3, 1903, Hadley Co., rep. of bdge. matl.	9 45	
" July 30, 1904, J. Seevers, repair of bridge	10 00	
" Aug. 27, 1904, Hadley Co., matl. for rep. of bdge.	4 24	

To Miller Leak Drain.—*Continued.*		
Order, Feb. 5, 1905, C. Vandusen, repair of bridge..	10 00	
" Apl. 25, 1905, A. Vandusen, repair of bridge..	3 00	
" July 29, 1905, C. Vandusen, repair of bridge..	5 00	
" Aug. 12, 1905, D. Vandusen, repair of bridge..	18 00	
" Aug. 5, 1905, Blonde Co., matl. for rep. of bdge.	37 00	
" Dec. 5, 1905, C. Vandusen, repair of bridge...	6 00	
		106 69
To Parrott Drain:		
Order, Sept. 24, 1903, B. Richardson, repair of bridge	5 50	
" Dec. 24, 1903, Laird Bros., matl. for rep. of bdge.	7 92	
		13 42
To Prince Albert Tap Drain:		
Order, May 4, 1903, Jno. Jenkins, repair of bridge....	8 00	8 00
To Simpson Drain:		
Order, Aug. 28, 1905, C. Vandusen, repair of bridge...	2 00	
" Sept. 23, 1908, C. Vandusen, repair of bridge..	2 50	
" Sept. 18, 1908, Brook Caton, repair of bridge..	2 00	
		6 50
To Glasgow Drain:		
Order, Sept. 10, 1903, W. Daly, repair of bridge.....	11 75	
" Dec. 18, 1903, J. Cooper, matl. for rep. of bdge.	10 99	
		22 74
To Parrott Drain:		
Order, Sept. 17, 1902, J. Moore, repair of bridge.....	14 50	
" Nov. 30, 1902, Laird Bros., matl. for rep. of bdge.	28 89	
		43 39
To Prince Albert Tap Drain:		
Order, Dec. 5, 1901, J. Moore, repair of bridge.....	20 00	
" May 13, 1904, J. Pool, repair of bridge.....	4 00	
" July 14, 1904, T. Watson, repair of bridge....	5 00	
" May 3, 1905, Chas. Wade, repair of bridge....	4 00	
		33 00
To Tweedle Drain:		
Order, Dec. 6, 1905, Jas. Moore, repair of bridge.....	10 00	
" Dec. 16, 1905, McNairnie Bros., repair and material for bridge	16 20	
		26 20
To Sylvester Drain:		
Order, Aug 26, 1904, I. Siddell, repair of bridge.....	10 00	
" Dec. 24, 1904, J. Malone, repair of bridge....	6 50	
" Sep. 20, 1904, Blonde Co., matl. for rep. of bdge.	11 06	
" Dec. 21, 1905, A. Strain, repair of bridge	2 50	
		30 06
To Glasgow Drain:		
Order, Sept. 21, 1906, J. Cooper, rep. of bdge. and matl.	13 59	
" May 2, 1907, W. Vance, repair of bridge.....	2 00	
" Oct. 27, 1908, W. Daly, repair of bridge.....	3 00	
" Oct. 7, 1908, J. Cooper, repair of bridge.....	8 32	
" Oct. 18, 1909, Jas. Fritz, repair of bridge....	2 00	
" Dec. 3, 1909, Jno. Cooper, repair of bridge...	13 44	
		42 35
To Prince Albert Tap Drain:		
Order, Dec. 9, 1907, J. Jenkins, repair of bridge....	10 00	
" Dec. 21, 1907, McNairnie Bros., matl. rep. bdge.	8 61	
" Dec. 21, 1907, McNairnie Bros., material for repair of bridge	2 25	
" Dec. 21, 1907, W. H. Pool, repair of bridge....	4 50	
" Dec. 17, 1907, Jno. Cooper, repair of bridge and material	3 20	
" Jan. 31, 1908, C. Wade, repair of bridge.....	3 00	

To Prince Albert Tap Drain.—*Continued.*		
Order, April 14, 1908, R. Parker, repair of bridge..	12 00	
" Jan. 19, 1908, J. Cooper, matl. for rep. of bdge.	27 24	
" Aug. 14, 1908, C. Wade, repair of bridge.....	7 75	
" Oct. 20, 1908, W. Bourne, repair of bridge....	5 00	
" Oct. 7, 1908, Jno. Cooper, material for repair of bridge	24 18	
" Aug. 31, 1908, McNairnie Bros., material for repair of bridge	22 40	
" Aug. 31, 1908, McNairnie Bros., material for repair of bridge	29 13	
		159 26
To McNaughton Ditch:		
Amount collected on 1909 roll, but not credited ($84.25).....		83 80
To White Ditch:		
Balance at debit		3
To Big Creek West:		
Short credit, 1907 and 1908, $113.80, should be $178.61.....		129 62
To Arnold Drain:		
Written off		16 46
To Johnston Best:		
Written off		5 88
To Lafferty Drain:		
Levy on 1904, rolls not credited the drain.....		135 52
To Manning Drain:		
See Resolution, Nov. 7, 1906		26 00
To Maxwell Creek West:		
Written off		92 26
To Poke Creek Drain:		
Old balance year, 1887		82 00
To Pike Creek, South Branch:		
Part of costs, see By-law 505		20 00
To Stone Drain:		
Levied on 1902, not credited drain account.....		107 06
To Paddy Drain:		
Nov. 30, 1901, A Coulter, charged in error.....		2 00
To Tweedle Drain:		
Order, July 14, 1908, J. Cooper, matl. for rep. of bdge.	16 92	
" July 7, 1908, C. Daly, repair of bridge.....	4 00	
" Oct. 7, 1908, J. Cooper, matl. for rep. of bdge.	17 28	
" Sept. 11, 1908, A Teeter, repair of bridge.....	3 00	
		41 20
To Mills Drain:		
By-law 513.		
Order, Oct. 28, 1903, Hadley Co., matl. for rep. of bdge.	2 21	
" Oct 28, 1903, Hadley Co., matl. for rep. of bdge	4 22	
" Nov. 8, 1903, S. Duncan, repair of bridge.....	2 50	
" Sept. 6, 1909, Wm. Drader, repair of bridge..	16 57	
		25 50
To Big Creek West:		
Order, Sept. 3, 1904, S. Hadley Co., material for repair of bridge	21 62	
" April 27, 1904, Thos. Griffith, repair of bridge.	15 75	
" Dec. 19, 1903, R. Lanigan, repair of bridge...	2 00	
		39 37

To Dykeman Drain:		
Order, Sept. 30, 1902, E. Bishop, matl. for rep. of bdge.	11 50	11 50
To Paddy Drain:		
Order, Apr. 26, 1904, A. Coulter, matl. for rep. of bdge.	11 00	11 00
To Big Creek Drain West:		
Order, Dec. 15, 1906, Hadley Co., material for repair of bridge	20 01	
" Dec. 22, 1906, A Coulter, repair of bridge....	45 00	
		65 01
To Chinnick Drain:		
Order, Apr. 13, 1906, J. Owens, repair of bridge.....	15 50	
" Apr. 13, 1906, Hadley Co., matl. for rep. of bdge.	8 71	
" Apr. 13, 1906, Hadley Co., matl. for rep. of bdge.	11 00	
" July 28, 1906, A. Moore, repair of bridge.....	15 00	
" Sept. 30, 1906, A. Moore, repair of bridge....	6 53	
" Dec. 15, 1906, Hadley Co., matl. for rep. of bdge.	10 75	
" Nov. 21, 1907, J. Owens, repair of bridge.....	35 00	
" Dec. 18, 1907, J. Cooper, matl. for rep. of bdge.	22 00	
		124 49
To Danforth Drain:		
Order, Nov. 30, 1905, W. Bird, repair of bridge.....	10 00	
" Dec. 9, 1905, W. Bird, repair of bridge.....	2 00	
		12 00
To Headley Drain:		
Order, April 3, 1907, S. Smith, repair of bridge.....	5 00	5 00
To Henderson Drain:		
Order, June 13, 1907, C. Vandusen, repair of bridge..	2 50	
" June 28, 1907, C. Vandusen, repair of bridge..	10 00	
" July 3, 1907, C. Vandusen, repair of bridge..	6 00	
" July 22, 1907, C. Vandusen, repair of bridge..	20 75	
" Dec. 21, 1908, P. O. Dawson, repair of bridge..	6 79	
" Order, Dec. 23, 1908, P. O. Dawson.....	5 00	
		51 04
To Miller and Leak Creek Drain:		
Order, April 9, 1904, W. Gray, repair of bridge.....	22 05	
" Mar. 10, 1906, C. Vandusen, repair of bridge...	6 00	
" Apr. 13, 1906, J. Owens, repair of bridge.....	8 50	
" Apr. 13, 1906, Hadley Co., matl. for rep. of bdge.	12 00	
" June 27, 1906, C. Vandusen, repair of bridge	3 00	
" Dec. 19, 1906, Hadley Co., matl. for rep. of bdge.	6 42	
" Dec. 22, 1906, C. Vandusen, repair of bridge..	8 50	
" Dec. 15, 1906, Hadley Co., matl. for rep. of bdge.	8 10	
" May 1, 1907, A. Vandusen, repair of bridge...	10 00	
" Apr. 30, 1907, S. Hughson, repair of bridge....	6 00	
" Oct. 29, 1907, Hadley Co., matl. for rep. of bdge.	8 32	
" Nov. 23, 1907, Hadley Co., matl. for rep. of bdge.	4 38	
" Oct. 7, 1907, Hadley Co., matl. for rep. of bdge.	11 88	
" Nov. 13, 1909, J. Gray, repair of bridge.....	3 15	
		117 30
To Simpson Drain:		
Order, Dec. 19, 1906, Hadley Co., matl. for rep. of bdge.	8 40	
" Dec. 22, 1906, C. Vandusen, repair of bridge...	6 35	
		14 75
To Sylvester Drain:		
Order, Dec. 15, 1906, S. Rodgers, repair of bridge....	10 00	
" Jan. 9, 1907, Blonde Co., matl. for rep. of bdge.	11 37	
" Jan. 26, 1907, W. Siddell, repair of bridge.....	2 00	
" June 15, 1907, J. H. Vandusen, repair of bridge.	11 00	
" June 15, 1907, J. Cooper, matl. for rep. of bdge.	18 58	
" June 28, 1907, J. H. Vandusen, repair of bridge.	1 50	
" July 26, 1907, J. W. Rosebury, repair of bridge	16 00	
" Aug. 3, 1907, W. Siddell, repair of bridge.....	12 00	
" Sep. 13, 1907, Blonde Co., matl. for rep. of bdge.	25 09	
		107 54

To Campbell Henderson Outlet:			
Order, July 17, 1908, J. Cooper, matl. for rep. of bdge.	1 92	1 92	
To R. C. Separate School:			
Short credit, 1909, collection in roll		1	
To C. & D. Townline Extension Relief Dr. Acct.:			
Half of order, Dec. 15, 1909, J. Cooper, plank, 8th concession bridge, $37.92		18 96	
To County of Kent:			
(Arrears of taxes).			
To adjust amount held by County Treasurer		265 40	
County rate, 1909,		5,136 26	
By Armstrong Ditch, balance at credit	4 00		
By Daly Award, balance at credit	8 50		
By Lucas Award	2 00		
By Miller Award	7 00		
By Thibeau Award	6 50		
			28 00
By Little Bear Creek Drain:			
Orders charged Townline account should be drain.			
Order, Apr. 8, 1909, Alex. Williston	145 00		
" Apr. 17, 1909, McNairnie Bros.	134 60		
" Apr. 24, 1909, A. Williston	25 38		
			304 98
By Centre Creek Drain:			
Balance transferred	22 63		
By Chatham and Dover Townline, Ext. Relief Drain:			
Order, July 28, 1909, W. Roseburg, charged townline account in error	2 50		
By Chatham and Dover Townline Drain:			
Order, Aug. 10, 1909, B. Herrington, charged Chatham and Dover Townline account in error	10 00		
			35 13
By Transfer from Tupperville Bridge			3,180 63
By Fixed Assets:			
Estimated value Town Hall			2,500 00
By J. W. Smith Drain:			
Written off in error in 1907			50 31
To Base Line, West Drain:			
Order, Dec. 2, 1901, S. Thibodeau, repair of bridge	18 00		
" May 6, 1902, W. Cooper, repair of bridge	6 25		
" Apr. 11, 1903, W. Cooper, repair of bridge	1 50		
" Apr. 25, 1904, W. Cooper, repair of bridge	5 50		
" Oct. 1, 1904, D. Lucas, repair of bridge	18 00		
" Nov. 14, 1904, McDougall & Gordon, rep. of bdge.	17 34		
" Apr. 12, 1907, S. Thibodeau, repair of bridge	15 00		
" Sept. 16, 1907, McNairnie Bros., repair of bridge	37 30		
" Nov. 11, 1908, McNairnie Bros., repair of bridge	14 63		
" Nov. 8, 1908, D. Teeter, bridge	10 00		
		143 52	
To Dykeman Drain:			
Order, June 16, 1904, J. Bishop, repair of bridge	2 00		
" June 27, 1905, E. Harrison, repair of bridge	6 00		
		8 00	
To McCouche's Creek Drain:			
Half of Order, Dec. 10, 1904, T. Moreland, rep. of bdge.	3 75		
Order, Sept. 27, 1905, G. Templeton, repair of bridge	1 25		
" Apr. 10, 1908, W. Moreland, repair of bridge	10 25		
" Sept. 28, 1908, J. G. Templeton, repair of bridge	4 25		
" Sept. 14, 1908, Jas. Anderson, repair of bridge.	1 50		
" Order, Sept. 28, 1908, E. Asselstone	2 50		
		23 50	

To McDonald Tap Extension Drain:			
Order, Apr. 14, 1902, J. Armstrong, repair of bridge..	16 75		
" June 22, 1903, I. Harper, repair of bridge.....	4 00		
" Aug. 13, 1904, D. Lucas, repair of bridge.....	38 00		
		58 75	
To McDonald Tap Drain:			
Order, Oct. 16, 1900, H. McLean, repair of bridge....	5 25		
" July 13, 1901, I. Harper, repair of bridge	5 25		
" Jan. 18, 1904, J. Price, repair of bridge.....	1 50		
" Aug. 25, 1904, A. Williston	36 00		
" Sept. 11, 1905, J. Dunderdale	2 90		
		50 90	
To Whitebread Drain:			
Cost of Whitebread Suit as ordered by Referee in his judgment.			
Order, Nov. 5, 1905, H. Cumming, witness fee.....	50 25		
" Dec. 2, 1905, W. G. McGeorge, witness fee.....	49 05		
" Dec. 4, 1905, A. McDonnell, witness fee	45 75		
" Dec. 15, 1905, Fred Druer, assistant survey.....	21 00		
" Dec. 4, 1905, W. G. Flater, witness fees.....	5 20		
" Jan. 24, 1906, Wm. Turner, assistant surveyor.	5 25		
" Feb. 7, 1906, W. G. McGeorge, survey and report	148 55		
" Mar. 5, 1906, Henry Winters, witness fees and expenses	43 40		
" Aug. 8, 1906, Jno. S. Fraser, law costs	500 00		
" Dec. 3, 1906, Geo. A. McCubbin, fees.....	51 50		
" Feb. 4, 1908, Jno. S. Fraser *re* five actions.....	628 28		
		1,548 23	
To Skinner Drain Works:			
Order, Jan. 26, 1909, A. Williston, repair of bridge....	245 00		
" Nov. 18, 1909, W. Pears, repair of bridge.....	3 00		
" Oct. 29, 1909, W. Goodwin, repair of bridge...	1 00		
		249 00	
Error in Audit Report on Dec. 31, 1909			5
1908, arrears of taxes charged to County Treasurer not in his hands April 16, 1910			282 04
Credit Balance		38,764 88	
		$48,913 28	$48,913 28

CHATHAM, ONTARIO, May 3, 1910.

To His Honour The Lieutenant-Governor in Council and

To the Municipal Council of the Township of Chatham, in the County of Kent:

Section 14 of Chapter 228, R.S.O., as amended by Sec. 53, Chapter 10, 1904, Ontario, provides that recommendations contained in the report of any person who has made a special audit under the directions of the Provincial Municipal Auditor, shall be carried out when concurred in and approved of by the said Auditor personally.

The Municipal Council of the Township of Chatham has requested me, under the authority implied by said Section 14, to review certain findings in the report of Mr. A. F. Falls, C.A., submitted herewith.

The findings to which the Council objects are:

First. Certain items set out in schedule XIV., alleged by Mr. Falls to have been improperly charged to drains and directed by him to be charged to the Municipality. These items apply to a number of drains (about 24) as set out in said schedule XIV.

Secondly. Items of $21 and $148.55, charged against Whitebread Drain as part of costs of certain actions at law in connection with said Whitebread Drain, which item Mr. Falls directs shall be charged against the Municipality.

Sub-Sec. (1) of Section 9 of the Municipal Drainage Act provides that the Engineer "shall in his assessment apportion the cost of bridges and culverts between the drainage work and the municipality or municipalities having jurisdiction over such public highway as to him may seem just."

Secs. 71 and 72 of the same Act provide that drainage works shall be maintained at the expense of the lands and roads in any way assessed for the original construction according to the assessment of the Engineer or Surveyor in his report and assessment, unless or until such assessment or proportion is varied or otherwise determined from time to time by the report and assessment of the Engineer or Surveyor.

I attended at the City of Chatham, the Towns of Wallaceburg and Dresden, and examined the by-laws, minute books, Engineers' reports and other documents in connection with the matters referred to.

I find that the Engineer's reports upon all of these drainage schemes are very similar. In his estimates under the heading "Bridges under Sub-Sec. 1 of Sec. 9 of Drainage Act, charged to the Municipality" the Engineer includes the cost of certain road bridges. Whether the power given to the Engineer by Sub-Sec. 1 "to apportion the cost" "between the drainage work and the Municipality" gives him the power to charge the whole cost to the Municipality need not now be considered. In my opinion, the reference in the Engineer's estimates does not constitute an assessment of the cost of the bridges against the Municipality.

In a schedule attached to his report the Engineer assesses the whole amount of his estimate, including cost of bridges, "against the lands and roads benefited." No specific assessment of cost of bridges is made in the schedule.

Mr. Falls assumes that the whole cost of road bridges is included in amount assessed by Engineer against roads and paid by the Municipality, and he consequently holds that the entire cost of subsequent maintenance and repair must be met by the Municipality. After careful consideration, I am not prepared to follow Mr. Falls in this assumption, nor to concur with him in his conclusions.

I therefore find that the cost of maintenance and repair of the bridges referred to is properly chargeable against lands and roads in the proportions determined by the Engineer's assessment.

As to the items secondly referred to and objected to by the Council, the only question appears to be, were these items part of the costs of the Township in the several actions respecting the Whitebread Drain? The two items objected to are cost of survey and report of Engineer. From the data furnished me by the Council, I find that the actions were commenced in the spring or summer of the year 1904. On July 18th, 1904, the Council passed a resolution instructing the Engineer to examine and report on the drain. The Engineer appears to have taken levels on September 29th, 1905, and actions came on for trial on 8th November, 1905. The dates and particulars appear to indicate that the examination and report of Engineer were a consequence of the actions; were necessary material for brief of counsel for defence and were so used. The cost thereof would, therefore, be properly costs against the Township as between solicitor and client, and chargeable, under the judgment of the Referee against the Township, as directed by Mr. Falls.

I concur in Mr. Falls' report except as to items set out in schedule XIV., respecting cost of roads, bridges and culverts hereinbefore referred to.

J. W. Sharpe,

Provincial Municipal Auditor.

26th July, 1910.

Room 66, Canada Life Building,
Toronto, 22nd December, 1909.

To the Reeve and Council of the Township of Evanturel, Heaslip.

Gentlemen,—Under the authority of an Order-in-Council, approved by His Honour the Lieutenant-Governor on the 3rd November last, I have completed the inspection, examination and audit of the books, accounts, vouchers and moneys of the Township of Evanturel undertaken at the request of a meeting of the ratepayers of your Township endorsed by your Council, with the exception of the verification of the list of arrears, which I shall at once place myself in a position to certify to.

I beg to report as follows:—

1904. The vouchers for this year have been lost, but I have satisfied myself from the perusal of the accounts by the Council, the counterfoils of the cheque book, the charges by the Bank against the Township in the pass book and from other sources, that they have been paid. In this connection I may mention that the Township's pass book covering the time they were keeping their account at New Liskeard (closed some years ago) was not written up. I had it sent on to be completed and the cheques returned.

With the exception of $75.70 not carried forward to the 1905 roll, the taxes for this year were properly accounted for.

1905. The taxes for this year were properly accounted for with the exception of $2.59. I recommend that this be written off. Three small sums also, amounting together to $4.51, were not carried forward to the 1906 roll.

1906. Statute labour for 1905 and 1906 was included in this year. Owing to utter want of system in filing pathmaster's returns and certificates of statute labour performed in connection with them, and my failure after diligent search among a mass of loose papers to find complete lists, I had to leave the charges against ratepayers under this particular head in an unsatisfactory condition, though I was generally satisfied the total amount charged was about right. These remarks as to statute labour apply to subsequent years also. There was a shortage of $28.10 in this year as between the amount credited in the Cash Book and the taxes paid as marked off on the Collector's roll. While the Treasurer is responsible, owing to his having neglected to give the Collector receipts from the Treasurer's receipt book, the counterfoils of which would have enabled me to determine what collections were made by the collector and what by the Treasurer; and from the credits being entered in the Cash Book simply as "Taxes" without stating from whom the Treasurer received them, it is impossible to say whether the fault lies with the Treasurer or Collector, and so I recommend that the $28.10 be written off.

Up to this point nothing has occurred but which may be treated as an honest mistake in bookkeeping.

I also remark that full particulars will be furnished of the amounts which were dropped from the collector's roll at the end of each year when I get replies from the taxpayers to whom I was writing for confirmation of the arrears of taxes standing against them.

The amount of taxes dropped this year was $65.40.

1907. In this year blame certainly attaches to W. J. Wood, the Clerk and Treasurer; to J. W. Roszel, Collector, and to Stuart Brown, Clerk and Treasurer for 1908.

Taking these in order, W. J. Wood is responsible for the following payments, perhaps proper enough, but not authorized by the Council. It must be understood that I make no insinuation against the gentlemen to whom these payments were made and I regret that the circumstances compel me to mention their names.

Sept. 13. Leslie Roszel, Road Division No. —, $47.00, authorized $25.

Sept. 13. W. Houghton, Road Division No. 4, $31.00

Sept. 13. Dan Mitchell, Road Division No. 4, $55.00, authorized $25.

Mr. Wood is also responsible for a payment of $95 made to him by J. W. Roszel on the 8th of January, 1908, on account of 1907 taxes, which he failed to credit. Mr. Roszel produced the receipt to me; there is no note of it in the Treasurer's receipt book.

Mr. Wood is also responsible for a receipt issued by him for $12.25 in payment of William Daly's taxes, the counterfoil of which will be found in the Treasurer's receipt book. These taxes are among those in the list of Englehart arrears.

Mr. Wood's bookkeeping was careless and he was loose in the matter of taking receipts and filing them.

Next as to Mr. J. W. Roszel, the Collector, I append to this report a copy of a letter I addressed to him. He responded by calling on me and producing receipts issued by W. J. Wood, to whom he had paid the money collected, from which I could gather no information beyond the fact that he had paid Mr. Wood. His chief anxiety seemed to be to impress the idea that the roll had been altered since it left his possession. He stated positively that he had marked paid No. 316 on the roll, McCamus and McKelvie, pt S½ 12, Con. 6, $55.50, and expressed the wish that he had a microscope, which he felt certain would reveal an erasure had been made. I pointed out to him that he must be mistaken, first, because the roll itself did not show the slightest evidence of it, and, second, because before the payment was made by him on the 17th January, 1908, the roll had passed out of his possession into that of W. J. Wood a month previously, who credited the money, but had failed to mark the taxes paid.

The cash paid by Roszel to the Treasurer amounted to more than the roll showed to have been paid. For this reason I wrote Mr. Roszel a second urgent letter, but he only reiterated his inability to give me the information I wanted, except in three trifling cases, a fourth being that of McCamus and McKelvie above referred to. Being unable to get any information from Mr. Roszel, I made a close search through some bundles of letters and documents and I fortunately lit upon a clue which led to my getting the information I was looking for. Amongst the papers I found a receipted bill for taxes. This was stamped paid by the Union Bank of Canada with their usual paid cancelling stamp. After satisfying myself the money had not been passed to the Township's credit, I asked the Bank for an explanation and discovered that Mr. Roszel had opened an account in his own name as Collector, and had made an endorsement on the back of tax bills requesting that they be paid to the Union Bank. The endorsement on the bill in the present Treasurer's possession shows this. Some $600 passed through this account, many of the credits being money paid in directly by the ratepayers, others being deposits made by Mr. Roszel himself. Mr. Roszel is therefore chargeable either with a deliberate misrepresentation or with having so little business intelligence as to be unable to appreciate the value of the information he was withholding from me. Of the fact that the money had been paid into the Bank, and that I could find no trace of it, I had informed him, but this did not lead him to make any explanation. The Bank pass book and the vouchers are the property of the Township. I have therefore written the Bank that if they have not been handed over to Mr. Roszel, they must not be, as being the

property of the township they would only be justified in giving them to the Clerk. I shall write to Mr. Roszel instructing him to hand them to the Clerk if they are in his possession.

Mr. Roszel did not comply with the statute which requires that he should put the date and his initials opposite every tax he collects. His failure to put his initials added to the confusion, as other dates, in writing which it was difficult to distinguish from his, appeared on the roll.

As to Mr. Stuart Brown, fairness compels me to say that he was quite unequal to the duties he assumed. Added to this disadvantage, judging from the character of his work, he seemed to have to contend against an indolent disposition and the natural consequence was confusion in his work, though I think him to be honest in intention.

Wood wrote up the Cash Book to the 2nd February, 1908. The Cash Book shows that there was a balance of $3.18 due him when Brown took charge. Brown's first entry is dated the 10th February. The Treasurer's receipt book shows the counterfoil of a receipt dated the 16th March, 1908, which reads as follows: "$11.75 received from Wm. J. Wood, balance of cash, etc., on hand." This naturally would be signed by Brown. Brown, therefore, instead of paying Wood $3.18, received from him $11.75. This, of course, is a matter between themselves in which the Township is not interested. Then Brown in handing over the books to his successor, the present Treasurer, had the Bank balance and the cash balance so entangled the present Treasurer refused to take charge of the books except on the distinct understanding that he should be held responsible only for transactions from the day of his acceptance and for the bank balance as shown by the pass book. I adjusted the bank account and found Brown to be owing the Township $39.13, which balance was not brought forward, the present Treasurer not having received it. Brown therefore owes it. He also owes $4.00, a sum paid by W. J. Wood to Hugh Jack on the 23rd December, 1907, more than six weeks before he took charge. If he pays it the money should be credited to Wood.

During this year a large number of taxes were credited, which, owing to the slovenly methods of both Collector and Treasurer, I found it very difficult to trace, but only two of them I failed to locate. "J. Clark, $5.80," and "Stewart, $2.75." These had been credited through the bank, but the bank could throw no light on them. The deposit slips were produced for my inspection, but beyond the fact that "Stewart" was "J. A. Stewart" nothing was learned. This does not help Mr. Brown, as the money was paid into the Bank to the Township's credit, therefore it was received. Then there were other two erroneous credits. Wilmot Briggs is credited $9.80 twice and Paul T. Broome, who should have been credited $20.00, is credited nearly double that sum. This does not help Mr. Brown's case either, for, allowing for these payments as having been made out of his own pocket, there is still 84 cents short credited on the 1907 taxes collected.

The amount of taxes dropped this year was $76.44.

Englehart was in your Municipality in 1907. I tried before I left to get from Mr. F. D. Ramsay, the Treasurer, a list of what collections the Town of Englehart had made on account of the Township, and also a list of those taxes which ratepayers claimed they had paid and which the Township believed to be outstanding. He stated his willingness to furnish the information and I expect the lists in a day or two at farthest.

1908. Mr. Leslie Roszel was Collector this year. His work was well done, and he is the only collector who has furnished a list of taxes he collected and a list of those in arrears at the end of his term of office.

Mr. Stuart Brown held office till the 6th of March, 1909. Mr. Leslie Roszel's

lists helped me materially, and the $13.55 short credited, as compared with the collections made, must be charged to Mr. Brown.

The amount of taxes dropped this year was $155.21.

1909. Your collector this year is keeping his roll in very fair shape.

I have checked the work of P. T. Broome, the Treasurer, from the 6th of March, 1909, the date when he assumed office, up to December of this year, and I find it in perfect order. The cash on hand agrees with the cash book balance and the bank balance is correct. His system of filing vouchers is satisfactory. I found it no trouble to check his accounts. It is only right to assure the Council that he is the fittest man they have yet appointed to the position, and from what I can see, the fittest man available. My thorough overhauling of your affairs and experience in such matters should entitle my opinion to consideration. I strongly recommend that the Council endeavor to keep him in his present office as long as possible so as to get the books and vouchers in proper running order, and if you were unfortunately to lose his services his successor would only need to follow in his footsteps.

It only remains for me to make a few recommendations which the Council should insist on being followed. If they are not followed, the present investigation will lead to no lasting practical result:

1. Collectors must not alter the Collector's Roll. Any supposed errors should be reported to the Treasurer. This rule should be rigidly enforced.

2. Collectors should be required to hand in a list with each payment, on a form supplied by the Treasurer, of all taxes collected, giving number on roll, taxpayer's name, con., part of lot, lot, and particulars of the taxes collected, also of discount allowed and percentage charged. Failure to follow this rule lays the foundation of just such entanglements as those from which you are now emerging.

3. When the Collector's Roll is returned, unless the paid taxes are marked with the date of payment and collector's initials, the Treasurer should refuse to receive it.

4. The collector when returning the roll should hand in with it a list of all taxes in arrears. The collector having faithfully complied with these rules will have cleared himself of all responsibility; if he does not comply with them he cannot free himself from blame.

5. The Treasurer should be furnished with fyles, Shannon or other suitable ones, and all answered correspondence should be placed on them.

6. When an invoice or account has been approved by the Council, the Reeve should mark it "approved" and add his signature and the date. The Treasurer should then pass it to the credit of the person or firm to whom the account is owing. This should then be placed on the Journal fyle and not be removed for any purpose. A separate receipt on the monthly statement, which is sure to follow, can be taken as a Cash Book voucher.

7. An innovation introduced by your present Treasurer, which to me is unique, ingenious and effective, of journalizing certain cash book entries without making a separate journal entry, I quite approve of, and recommend that the practice be continued.

8. No arrears of taxes should be dropped from the roll without a special minute of Council authorizing it.

All of which is respectfully submitted,

Your obedient Servant,

H. R. Morton,

Auditor appointed by His Honor
the Lieutenant-Governor in Council.

Room 66, Canada Life Building, Toronto, 9th December, 1910.

To the Reeve and Council of the Township of Evanturel, Heaslip:

Gentlemen,—In my report of the 22nd December last I stated that a verified list of arrears was to follow. I now enclose the list, amounting to $1,396.65, which shows the amount of arrears on the 31st December, 1908, and interest as per your arrears book, under the separate headings of Township rates, Statute Labor, General School rates, School rates for Sections Nos. 1, 2 and 3, and the interest charged. This analysis was necessary to show the amount in arrear on the different school section assessments, so that when the arrears are collected they could be properly applied. During 1909 a number of these arrears were collected. I enclose a second list amounting to $1,409.52 showing if arrears were paid, balance admitted or objected to by owner. Accompanying this second list is the correspondence alluded to in it. A number of the circulars I sent to the ratepayers were returned to me, the Post Office authorities not being able to find them at address given. These returned notices also accompany this report. The reason why the totals of the two above lists differ is that the first list, amounting to $1,396.65, shows the arrears of 1908 roll $1,409.52, to which was added $125.04 interest and $10.79 as arrears on S. ½ 8 in 2, and $6.51 as arrears on N. ½ 4 in 4, neither of which appeared as arrears on the 1908 roll. From this was deducted $155.21 unpaid taxes on 1908 roll which were not brought forward on 1909 roll.

In compliance with instructions received from the Reeve, I enclose a list of taxes amounting to $374.19 (supplementary to the list of 1908 arrears) that for various reasons given at the end of the list should be written off in my opinion.

In the paragraph before the closing one respecting the year 1906, in my report of the 22nd December last, I promised full particulars of the taxes dropped from each collector's roll. I now enclose them.

I also enclose a list of Englehart taxes for 1907 (when it formed a part of your municipality). They amount to $1,517.79 *and have been dropped from your collector's roll and do not appear on your books.* I furnished duplicate copies of this list to Mr. F. D. Ramsay, Clerk and Treasurer of Englehart, that he might fill in the percentages that were added to the taxes for 1908 and 1909 and the last known owner's name and address, but I could neither get the list back nor an acknowledgement of its receipt, though I repeatedly asked for it. The only information I succeeded in getting was a list of the taxes collected by Englehart amounting to $459.89, containing only the name of the payer and amount of each collection. I also enclose a copy of this list. Duplicate copies were forwarded to Mr. Ramsay that he might fill in the Assessment and lot numbers for the purpose of identification, but he never sent them back filled in nor acknowledged receipt of them.

I may mention again here that Wm. Daly paid W. J. Wood $12.25 Englehart taxes which were not credited, and the taxes are still outstanding on the above list.

No separate accounts have been kept of the moneys collected for General School Rates nor for the different School Sections, and all payments made by the Township of whatever character have been made indiscriminately out of the total taxes collected. Each requisition of the School Trustees should have been levied on the School Section to which it applied, and payments on each requisition should have been made out of the collections made on its School Section rates. School Rates

raised on any particular School Section may only be applied in payment of requisitions on that School Section.

For the information of the Council I enclose a statement showing the School Assessments made from 1904 to 1908 inclusive, the amounts collected under the Assessments, the amounts written off by order of Council or dropped, and the arrears carried forward to 1909 Roll to which is appended a list of payments, furnished me by the Clerk and Treasurer of the Township, made to the treasurers of the different school sections under the requisitions they had made.

The particulars of the arrears of School taxes on each lot will be found on the list of arrears to the 1st January 1909.

I should perhaps explain that the following amounts were not accounted for: In 1905, $2.59, and in 1906 $28.10, which I recommended in my report of the 22nd December, 1909, should be written off. I so recommended on the supposition that the shortages would be charged up. As they never were charged up, there is nothing to write off.

The balance of cash on hand, as shown by the cash book, on the 18th December, 1908, the day to which I audited, was $14.25, and the balance in the bank, as shown by the cash book, was $846.38.

All of which is respectfully submitted.

Your obedient Servant,

H. R. Morton,

Auditor appointed by His Honor
the Lieutenant-Governor in Council.

TOWN OF STURGEON FALLS, ONTARIO.

To His Honour, the Lieutenant-Governor in Council,
Parliament Buildings, Toronto, Ontario.

YOUR HONOUR,—The authority to me bearing date of 23rd November, 1909, received through the Provincial Municipal Auditor, I. W. Sharpe, Esq., was exercised in conducting an audit of the books, accounts, vouchers, and moneys of the above municipality, the same being brought to a conclusion to December 31, 1909, as per my report.

A petition of the ratepayers of the above named municipality to the Provincial Government praying for a special audit was followed by my appointment, and I was instructed to proceed to the town of Sturgeon Falls forthwith.

On my arrival there on the 29th November, 1909, I at once called on the Town Clerk, who informed me that he was not in possession of a copy or any other information as to the nature of the petition, beyond that he understood it was on account of the Public School Board being in extreme financial difficulty. While I was in his office the Mayor came in and handed to the Town Clerk a writ of fi. fa. that had been served upon him the previous evening. Said writ attached all moneys due by the Town Council to the Public School Board, primary creditor the Trader's Bank for moneys loaned to primary debtor the Public School Board. After having read the writ I asked the Mayor to give me some particulars as to the petition, and was promptly informed the Council knew nothing about it. Knowing the names of some of those who signed the petition, I looked these people up, and was informed by them that they were members of the Public School Board, that for some years they had been unable to collect the amount of their requisition from the town, that they had been unable to pay their teachers any of the salary due them since the school opened in September, 1909, that they owed the Trader's Bank a sum of about $6,000.00, borrowed by reason of the inability of the town to meet their requisitions, that now the bank was pursuing them for the money, and that the finances of the town generally were in a most unsatisfactory condition.

I called on the Treasurer of the town, who was also Treasurer of the Public School Board, and got about the same statement from him.

I called on one of the local auditors and learned from him that the town accounts had not been very satisfactory for some years. I examined the Treasurer's Cash Book, the only book kept, and found that there was little to rely upon since the last special audit, made by the late T. G. Williamson, Chartered Accountant, which was completed to Aug. 27, 1903. I therefore concluded to go back to that date, and so advised all concerned. Then by a special resolution the Council requested me to bring the audit down to the 31st of December, 1909, which has been done.

The trouble appears to be largely owing to the low rate of taxation imposed having regard to the actual requirements of the town, and to difficulties in collecting taxes overdue, especially from the Imperial Paper and Land Companies, both of which are now insolvent and in process of liquidation, and to a legacy of heavy obligations left by former Councils.

ACCOUNTS.

No accounts or books of any description except cash book and debenture register have been kept, notwithstanding the recommendations of the late Mr. T.

C. Williamson, who made a Provincial audit in 1903. In 1906, at the instance of the Council, a special audit was made by Hardy and Hammond of North Bay, and apparently they suggested a number of improvements, but beyond obtaining a cash book on their plan, nothing further appears to have been done. A ledger was procured also, but it has never been used.

Cash Book.

The treasurers apparently have never attempted to make a balance, leaving that for the auditors. In the audit of 1903 the local auditors reported that they were unable to make a balance, and laid the blame on Mr. Williamson, stating that they thought he had made corrections and had not altered the figure totals. They did not appear to be accountants of sufficient calibre to prove this. The cash book for 1904, 1903, and preceding years was in a very irregular condition. There was a great absence of dates, and entries overlapped each other in all directions. Sometimes cheques issued three and four months prior or subsequent to each other were entered in the cash book in sequence. Receipts were dealt with much the same way. I spoke to one of the local auditors about the balances for 1903 and 1904, he told me that when working on the 1904 audit, despairing of making a balance, he had gone back several years and worked forward to the end of 1904, and thus obtained a balance. If you will look at my Cash Statement for 1903, you will see how I got at it. From 1905 forward there was a better and more careful record, but at no time during the past six years did the treasurer's statement agree with the actual facts as I found them. Kindly note copy of statement attached to each cash statement for 1909 as an example.

Debenture Register.

This was fairly well entered, but a good many entries, corrections, explanations, and calculations were made therein by the late Mr. T. G. Williamson. I added a few to complete some of the records, which have been entered since Mr. Williamson was there.

Assessment Rolls.

The rolls up to 1907 are very irregular. A good deal of carelessness is manifest in their preparation, but 1907, 8, 9 rolls are very well prepared and in accordance with the act, with this exception:

Some time, I cannot say when, the Imperial Land Company, Limited, had a section cut up into lots, streets surveyed, and incorporated as town lots. A number of these lots were sold to various persons, and in a number of cases houses and other buildings erected on them. No record is in existence of the town authorities that I could find as to a plan for this property, although the present Town Clerk assured me there had been a proper plan made by an O. L. S. from Sudbury, but he cannot say further, and supposes there is one in the Registry Office at North Bay. I examined back to 1902 and find the Assessors have regularly copied from each other as:—"Part Lot A. Concession 3. So much land, 1-5 acre, etc." The present assessor, a careful, painstaking official, assures me he is not prepared to swear as to the identity of a good deal of the property, beyond that he understands that this belongs to so-and-so, that to some other so-and-so. This is, of course, irregular, and the authorities should be compelled to obtain a plan, and the assessor also be compelled to give proper description.

The index book required by Section 48, Chapter 294, R. S. O. 1897, is not kept. I cannot find ever was in existence. No reason forthcoming why. In view of the fact that a large number of the town's inhabitants are Separate School supporters, it would appear that this should be prepared at once.

I understand from the Secretary of the Public School Board that properties assessed for Public School Debentures have passed into the hands of Separate School supporters, and are now being assessed for the Debentures. Upon enquiries of the Town Clerk, I was informed that there had been some cases, but the amounts were very trifling. I looked up a few in the assessment and collectors' rolls and saw some had apparently changed ownership, but it would have entailed more expense on the town for me to have followed these out, searching in Registry Office, etc., than the matter appears worth. I, therefore, did not go into the subject any further, and now draw this to your attention, as I consider the town officials themselves ought to rectify it, as it is certainly an irregularity.

Collector's Rolls.

Until the year 1907 these rolls were very badly prepared, and hardly in agreement with the assessment rolls, but since the appointment of J. D. Cockburn, the present Town Clerk, they have been very much better and few irregularities appear in them. You will see by copy of attached by-law that J. D. Cockburn was also Collector. When I mentioned to him that he never should have held the position, he admitted it, but said things were in a bad way and someone had to be appointed. While it is wrong, and he had no right to the appointment, I must say that until then the taxes were very badly looked after. Upon questioning some of the Council as to looseness in collecting arrears, the answer invariably was the roll was not properly returned, the property was not properly described, the person was away before we knew it, there was nothing to distrain. It looks as if no one bothered much about such matters while it was so easy to get money from the bank. I have shown on separate statements Imperial land and Imperial Paper Mills Company's taxes, and how arrears have accumulated, through looseness and absence of proper action.

J. D. Cockburn, as collector, kept a cash book, and all moneys received were entered under their respective heads. He had slips printed to correspond with these, and on paying money to the treasurer he filled in the slip, handing over money and slip. The slip became an excellent and reliable voucher. Before this the collectors handed the treasurer moneys, calling it taxes or rates, or dog taxes, or any other name they felt like giving it. This has caused confusion and worry, especially to me, in trying to get at the bottom of things. The tax collectors, keeping no kind of a book or merely a memorandum book, considered it their own, and it is not now in the possession of the town authorities. The present treasurer has supplied the present tax collector with a book similar to the one used by J. D. Cockburn, made it town property, and refuses to accept moneys unless on this slip, which slip is to agree with the collector's cash book. All the collectors did keep some kind of a record in the column provided for that purpose in the tax roll, but it was very unreliable, and afforded in many cases not much information.

Dog Licenses.

The issuance of tags and collections of fees have been variously entrusted to constables and town collectors. There is a very loose manner of recording and

accounting. The assessor has for several years given up entering the number or sex in his roll. There are many dogs in evidence on the street, but the rolls show no evidence of any.

Other Licenses.

The Town Clerk keeps an excellent record, and does this well.

Police Fines.

These are vouched and agree with entries in cash books. The police magistrate is a very careful official.

Minute Books.

Not indexed, and have sometimes reached as many as 7 records of meetings without confirmation. Three and four meetings not confirmed are quite common. Since J. D. Cockburn has been clerk, they are confirmed as they should be. As a result of non-confirmation the following irregularities amongst others have crept in:—

Minutes of meetings held:—

1906.		
Sept. 7.	Not signed by Clerk.	Not signed by Mayor.
Oct. 11.	Not signed by Clerk.	Not signed by Mayor.
Nov. 7.	Not signed by Clerk.	Signed by Mayor.
Dec. 7.	Not signed by Clerk.	Not signed by Mayor.
Dec. 15.	Not signed by Clerk.	Not signed by Mayor.
Dec. 28.	Not signed by Clerk.	Not signed by Mayor.
1907.		
Jan. 14.	Not signed by Clerk.	Not signed by Mayor.
Jan. 21.	Not signed by Clerk.	Signed by Mayor.
Jan. 25.	Not signed by Clerk.	Not signed by Mayor.
Feb. 4.	Not signed by Clerk.	Not signed by Mayor.
Feb. 4.	Not signed by Clerk.	Not signed by Mayor.
Mar. 4.	Not signed by Clerk.	Signed by Mayor.
April 3.	Not signed by Clerk.	Signed by Mayor.
May 20.	Not signed by Clerk.	Signed by Mayor.
June 3.	Not signed by Clerk.	Signed by Mayor.

By-Laws.

The By-Laws are not indexed, and there appear some other irregularities.

By-Law 193	Sealed.	Not signed at all.
„ 194	Signed.	Not sealed.
„ 195	„	„
„ 196	„	„
„ 197	„	„
„ 198	„	„
„ 200	„	„
„ 209	„	„
„ 210	„	„
„ 226	„	„

The Act provides that some by-laws must be registered, and others need not be, but that any and all may be if so desired. Advantage appears to have been taken of the clause that some need not be, but as it is long ago, and the offender is dead, I will only draw your attention to a few that might have been registered and were not, and others that should have been registered and were not.

By-Law	54A.	Jan. 22, 1900.—Water Works 30 year Debentures.
„	79	Dec. 29, 1900.—Public School 20 year Debentures.
„	106	July 28, 1902.—Sewers 30 year Debentures.
„	169	Aug. 10, 1905.—Consolidation Debt, 30 year Debentures.
„	168	Aug. 10, 1905.—Municipal Buildings, 30 year Debentures.
„	179	July 9, 1906.—Public School, 20 year Debentures.

Public School.

The books were in about the same condition as the town books. There has never been a ledger on any accounts kept by the treasurer, nor attempt made to balance or finish one year, before overlapping into another, since 1903, when Mr. Williamson straightened them out. The local auditors have regularly made the balances as they did in the town books. An absence of dates, of correct additions, of several statutory requirements is quite conspicuous. The treasurer resigned in 1909, and the new treasurer, who is also secretary, assumed duties in January of this year. On looking through the papers, etc., I found that, while secretary only, the new secretary had been keeping a ledger for his own satisfaction, and keeping it well. I have assisted him to frame a set of accounts which he understands, and while he retains his position I do not expect to see any more bad bookkeeping in this department. I attach copies of the Cash Book, as straightened out, and detail of the School's Assets and Liabilities, also of Balance Sheet.

Separate School.

This calls for no special comment. The books are well kept, and I found everything in order.

Insurance.

There is no insurance on the town transient property valued at $4,559.00. As there is no valuation or proper inventory taken or kept of this, I am obliged to put it in as it has been put in before. I can only say I am assured by the town officials it is there, and that that is the value. It has apparently never occurred to the Council that it should be insured. There is $20,000.00 on the school building in Tariff Companies; $2,000.00 on the school equipment, also in Tariff Companies.

Bonds.

The town treasurer, A. W. Smith, appointed in January, 1910, has $5,000.00 dated January 15, 1910, for one year, premium $40.00 paid by the town, in United States Fidelity and Guarantee Co. of Baltimore, Maryland. The tax collector, I. Quenneville, appointed same date, has an application forwarded for $2,000.00 from January 15, 1910, premium $20.00 paid by town, in Imperial Railway, Accident and Guarantee Co. of London, England. The Public School Treasurer, W. C. Parliament, appointed same date, has an application forwarded for $1,000.00 in same company as town treasurer.

Balance Sheet.

Investment Balance Sheet. Statements attached to this will show the manner in which the money has been expended. I need not dwell further on this, but there are some matters I would like to say a word upon.

It is evident by comparison of construction of works and sales of debentures that the money was largely borrowed from the bank in advance, and sometimes in excess of the realization of the debenture sale. The debt piled up in consequence and was consolidated. Getting behind again, an attempt was made at the elections of January 3, 1910, to pass a by-law for $20,000.00 to again consolidate the debt, but it was defeated. The Municipal Building Debenture issue of 1905 had a short life. This issue passed through the bank's hands, and, as the town was heavily indebted to them, the consolidation debt issue and this one were apparently used to liquidate the indebtedness. The assets have been simply stated at their expenditure values, there being no available guide for any other valuation. Nor have I shown any interest upon works during construction, as I do not know where or how I could find any record of it.

Current Balance Sheet. I have deducted the taxes said to be due by the two companies from the roll of 1909, and shown them according to the information I have been able to obtain, trusting to make somewhat plain the tangle of these taxes. As no proper record has been kept of the arrears, and a number are on the Imperial Land Company's former lands which have no description, as already described, it is extremely doubtful if they can ever be collected. The provisions of the Assessment Act authorizing collection of taxes by action will be of little value as far as the Imperial Land and Imperial Paper Mills Companies are concerned, in view of their insolvency.

I would also draw your attention to copies of By-laws 139, 154, 189, 218 attached, and extracts from the auditor's report of 1908:—"During the year considerable confusion existed owing to the method of paying wages of the workmen and some other accounts of the water works department. We are of the opinion that all moneys collected should be paid to the Treasurer, who should be responsible for all payments made. The explanation given for the money collected in the water works department not being paid directly to the Treasurer was that certain local improvements for which debentures were issued had to be completed in order to make the issue legal, and that if the money had been deposited in the bank by the Treasurer, it would have been held by the bank on the overdraft. We believe this difficulty could not have easily been overcome.

"We have seen a cheque issued by the collector for $6,000.00 when his bond was only for $2,000.00. We wish in no way to impugn the honesty of the collector, but to point out a system which we consider bad.

"We found among Mr. Gibson's accounts three items which he had paid and neglected to charge to the town. Against this you will find in the accounts receivable the amounts Mr. Gibson owes the town.

"We should have liked to have gone into the matter of costs of the cement walks, but on making enquiry of Mr. Gibson, we were informed that the papers were prepared for the Court of Revision. No appeals were made, assessment confirmed, he did not consider the preservation of the detail necessary."

Mr. Gibson appears to have made the assessment, collected the rates, paid all charges, wages, etc., and handed the treasurer any surplus. On one or two occasions he kindly loaned the Treasurer a few hundreds and then got the loans re-

turned. He had a separate account in the Quebec Bank and issued his own cheques for everything. These were passed through the town books in totals.

During 1909 the treasurer by authority and sanction of the Council had what is called a trust account, and issued his own cheques against it. Also because the Council owed such a large current account.

Neither of these irregular banking transactions appear in the town books or records.

I have helped the new treasurer with suggestions and other assistance, and, as they are both practical, painstaking men, I feel satisfied the future accounting of the town and public schools will be well and carefully done, and the recurrence of bad bookkeeping conspicuous by its absence.

Generally speaking, poor pay brings poor results, and although it certainly is none of my business I do think the Town Council and Public School Board would have better results if they paid their treasurers larger salaries.

As a result of the audit, etc., I make the following recommendations:

1. A special Land Register should be obtained forthwith and written up, showing the arrears of taxes as on December 31, 1909, and when the collector's roll of 1909 has been returned such further taxes as appear to remain unpaid should be entered therein, these arrears to remain in the hands of the town treasurer for not less than three years (unless sooner paid) at which time the return (see Sec. 121, Chap. 23, 4 Edward VII.) should be made to the town clerk, and the procedure outlined followed in every respect.

2. An official receipt book should be in the treasurer's possession and all moneys received by him be receipted for in this book, the stub being made to correspond with the receipt given.

3. There are at present a number of different bank accounts kept. It would be much better to consolidate these and keep separate accounts in the town ledger.

4. A dog register should be obtained and kept, showing: number, sex, name of dog, when tag was issued, who to, description and breed, so that some permanent record would be available and a voucher at hand for tags issued.

5. The assessor should be directed to find the owners of all dogs and so record them in his roll, as the Act directs.

6. Inventories, valuation, and insurance effected on all the town's transient property.

7. That a special account be kept of local improvements, water works, etc.

8. That proper books of account be opened as of January 1, 1910, in accordance with the findings of this report, said books to be kept written up to date.

9. That proper conveniences for filing and security of the Corporation documents and records be supplied both the Clerk and Treasurer.

10. That the Treasurer be required to keep on file the following returns:

(a) Collector's account for taxes remaining due on roll.

(b) List of lands liable to be sold.

(c) List of occupied lands.

(d) Return of taxes on occupied lands.

11. That the provisions of the Assessment Act in reference to the sale of lands for arrears of taxes be observed.

12. That the collector shall make his return of uncollected taxes to the treasurer, in the form required by law, delivering a duplicate of the same to the clerk.

13. That the details of the annual estimates as finally passed upon by the Council be incorporated in and become part of the by-law striking the rate.

14. That the clerk be required to keep on file the following returns:
(a) List of lands liable to be sold.
(b) Assessor's occupied returns.
(c) Return of taxes on occupied lands.

15. That a Water Works cash book be obtained and opened, in which shall be entered all moneys received by the collector from water takers, in order of receipt, upon the one side; and the same be balanced as moneys are paid over to the treasurer, by entering the payments on the other side.

16. That local auditors be compelled to present a yearly balance sheet, in form and affording the same information as the one I have prepared for 1909.

The attention of the Council is called to Sec. 14, Chap. 228, R. S. O. 1897, and amended thereto Sec. 53, Chap. 10, 4 Edward VII., which requires that the recommendations made in this report shall be carried into effect.

Owing to the absence of a number of records that should have been in evidence, much more time has been consumed in connection with this audit than would have otherwise been necessary.

I shall be pleased to correspond and advise with the Council in reference to any recommendations contained in this report.

The present treasurers, town, public and separate school, the town clerk and some members of the Council, who have been called upon for information and other assistance in the present examination and audit, have complied with the utmost cheerfulness and willingness, for which I desire to express my obligations, also the manager and accountant of the Trader's Bank, to whom I am deeply indebted for valuable information and assistance.

All matters of enquiry having been dealt with as fully as possible, the result of the audit is now respectfully submitted.

W. J. Ross,

Chartered Accountant.

Barrie, March 14, 1910.

TABLE OF TOTALS—COLLECTOR'S ROLL.

1903.

Town Levy	10 mills.	$3,902 11
Bonus Debentures	1½ "	585 84
Public School Debentures	1⅛ "	451 51
Water Works Debentures	3½ "	1,365 54
Sewers Debentures	3½ "	1,365 75
Public School Debentures	2⅛ "	849 34
Public School, General	9 "	2,777 79
Separate School, General	17 "	1,460 64
Dogs	.....	44 00
		12,802 52
Arrears		1,154 87
Total		13,957 39

1904.

Town Levy	5 mills.	$6,058 10
Bonus Debentures	⅔ "	808 94
Water Works Debentures	1⅗ "	1,937 00
Sewers Debentures	1⅗ "	1,937 02
Public School Debentures	⅝ "	784 52
Public School, General	3⅓ "	3,002 72
Separate School, General	5 "	1,577 59
Separate School Special	1 7/10 "	522 47
Dogs	.....	66 00
		16,694 36
Arrears		621 61
Total		17,315 97

1905.

Town Levy	5 mills.	$7,220 70
Bonus Debentures	1½ "	720 40
Water Works Debentures	1⅛ "	1,913 58
Sewers Debentures	1⅛ "	1,913 58
Consolidated Debentures	1⅛ "	1,913 58
Municipal Building Debentures	1 "	1,441 94
Public School Debentures	¾ "	877 31
Public School, General	3 "	3,380 13
Separate School, General	7 "	2,117 13
Separate School Special	1⅛ "	501 37
		21,999 72
Arrears		870 33
Paper Mills Arrears, 1904		7,138 49
Total		30,008 54

1906.

Town Levy	6 mills.	$12,851 88
Bonus Debentures	½ "	1,072 20
Water Works Debentures	1 "	2,142 33
Sewers Debentures	1 "	2,142 03
Consolidated Debentures	1 "	2,142 31
Municipal Building Debentures	¾ "	1,609 02
Local Improvement	.....	2,115 40
Public School Debentures	1½ "	1,488 22
Public School Debentures	⅜ "	1,194 65
Public School, General	3 "	5,371 57
Separate School, General	.....	2,451 64
		34,581 25
Arrears		1,188 30
Total		35,769 55

1907.		
Town Levy	6 mills.	$9,879 19
Bonus Debentures	$\frac{1}{8}$ "	547 36
Water Works Debentures	1 "	1,646 10
Sewers Debentures	1 "	1,646 10
Consolidated Debentures	1 "	1,646 10
Municipal Building Debentures	$\frac{1}{2}$ "	822 20
Public School Debentures	$\frac{1}{2}$ "	626 05
Public School Debentures	$\frac{2}{3}$ "	836 28
Public School, General	$3\frac{1}{2}$ "	4,386 07
Separate School, General	$7\frac{1}{2}$ "	3,058 04
Local Improvement Sewers	.....	1,830 47
Local Improvement Sidewalks	.....	862 24
		27,786 20
Arrears		616 94
Imperial Land Co., Arrears		1,557 95
Total		30,061 09
1908.		
Town Levy	6 mills.	$12,315 00
General Debentures	4 "	8,210 00
Public School Debentures	1 "	1,706 36
Local Improvement Sewers	.....	1,830 44
Local Improvement Sidewalks	.....	862 26
Public School, General	4 "	6,825 47
Separate School, General	10 "	3,961 80
		35,711 33
Arrears		757 98
Total		36,469 31
1909.		
Town Levy	7 mills.	$11,570 65
General Debentures	7 "	11,570 65
Public School Debentures	$2\frac{1}{2}$ "	3,133 22
Public School, General	7 "	8,772 38
Separate School, General	10 "	4,101 49
Local Improvement Sewers	.....	1,764 38
Local Improvement Sidewalks	.....	809 17
		41,721 94
Arrears		3,698 10
Total		45,420 04

BALANCE SHEET OF PUBLIC SCHOOL AS AT DECEMBER 31, 1909.

Liabilities.

To Sundries as per list	$7,891 28	
" Award of Judge Valin	1,197 67	
		$9,088 95
" Surplus over present liabilities		7,216 09
		$16,305 04

Assets.

By Cash in Quebec Bank	$108 72	
" Cash in Traders Bank	8 55	
" Balance due on requisitions	12,931 71	
		$13,048 98
" Value of Equipment as per list	$1,089 85	
" Value of Sundries as per list	110 90	
" Baptist Church transaction	2,055 31	
		3,256 06
		$16,305 04

Members of the Town Council have informed me that they did not consider the town owed the Public School Board the full amount of their requisition on these grounds: As they could not collect the whole levy, as the Board would not pay the Separate School the sum due them on the agreement as per Chapter 69, 4 Edward VII., R.S.O. 1904, page 436, as they mishandled their debentures, etc. A glance at the above balance sheet will show that they certainly do require all they requisitioned for, as their liabilities amount to $9,088.95, and the requisition and cash on hand equal $13,048.98, a difference of $3,960.03 to carry them on from January 1, 1910, until the taxes begin to come in at the latter part of the year, which seems to make them require every cent of it. And in any case, Toronto School Board vs. City of Toronto, *vide* 4, Ontario Law Reports, would appear to leave the Council no discretion in the matter.

In view of the Council's peculiar transaction over the award against the Paper Mills, and the notes of the Land Company, there does not appear to be any shelter for them in Section 188, Chapter 23, R.S.O. 1904.

STURGEON FALLS, ONTARIO.

Public School Liabilities.

December 31, 1909—		
E. Maltby, Caretaker	$84 00	
J. T. McCosh, Teacher	325 00	
Miss B. M. Ivel	115 00	
Miss E. Findlay	115 00	
Miss B Smythe	125 00	
Miss A. E. Brown	95 00	
		$859 00
R. Lillie, supplies		6 84
Corporation of Sturgeon Falls, water rates	$17 00	
Corporation of Sturgeon Falls, sewer service	93 52	
Corporation of Sturgeon Falls, levy (taxes)	11 56	
		122 08
Electric Light Company, light		11 68
Advertiser Printing Company, supplies		7 00
J. Dunn, supplies		1 30
A. W. Smith, supplies		14 70
Kerr, Davidson & Patterson, law costs		150 00
J. B. McDougall, examination papers		9 40
Traders Bank		6,709 28
		$7,891 28

When the present Public School was completed the old school was sold to the Baptist Church of Canada for $2,000.00, but the deal was never consummated. Deeds were drawn and are still in possession of the Public School Board, unsigned. Some correspondence is attached to the deeds, showing that the congregation of the Baptist Church in Sturgeon Falls are unable to pay for the property. A kind of an agreement has been effected by which the congregation are to pay at present a rent, but the matter is on a very unsatisfactory basis. The School Board have an insurance on the building, payable to them in event of loss by fire, to the amount of $1,500, and practically that is all the Board has. Something has been paid on account of the purchase, and at present the Board considers the Baptist Church owes them $1,952.60, with accrued interest, $102.71 = $2,055.31, but legally they have no claim against the Baptist Church whatever. The Baptist congregation have possession without any legal right to it. This should be rectified at once.

PUBLIC SCHOOL CASH STATEMENT FOR 1909.

RECEIPTS.

Fees		$10 00
Government Grant for 1906-7-8-9		509 00
Township of Springer, 1908-09		211 00
Town of Sturgeon Falls		1,000 00
Loans from Traders Bank		11,893 00
Miscellaneous		50 00
Total Receipts		$13,673 00
Cash on hand, 1908		580 67
Quebec Bank Savings Account		594 60
		$14,848 27

EXPENDITURES.

Teachers' Salaries		$1,838 00
Other Salaries		450 00
Fuel Supplies, etc.		401 71
Repairs		8 40
Printing, Stationery, etc.		5 90
Sundries		25 79
Bills Payable, Traders Bank		11,893 00
Interest		108 20
Total Payments		$14,731 00
Balance in Quebec Bank	$108 72	
Balance in Traders Bank	8 55	
		117 27
		$14,848 27

When the school sold the old building to the Baptist Church an account was opened in the Quebec Bank, and all moneys received on account of the sale were deposited there, to obtain a fund to purchase an extra piece of land, adjacent to the school property. This fund had to be drawn upon, which explains above debit entry.

PUBLIC SCHOOL CASH STATEMENT FOR 1908.

RECEIPTS.

Fees	$4 00
Government Grant	190 00
Township of Springer	238 47
Town of Sturgeon Falls	4,086 07
Loans from Traders Bank	17,356 60
Total Receipts	$21,875 14

EXPENDITURES.

Teachers' Salaries	$2,865 00
Other Salaries	525 00
Fuel Supplies, etc.	848 40
Repairs	89 35
Examinations	11 10
Printing, Stationery, etc.	27 09
Equipment, Maps, etc.	26 87
School Building	327 50
Sundries	40 92
Bills Payable, Trader's Bank	15,393 75
Interest	26 70
	$20,181 68
Bank Overdraft, 1907	1,112 79
Cash on hand, 1908	580 67
Total Payment	$21,875 14

PUBLIC SCHOOL CASH STATEMENT FOR 1907.

Receipts.

Fees	$16 75
Government Grant	75 00
Town of Stureon Falls	4,000 00
Loans from Traders Bank	53,863 40
Sundries	157 25
Total Receipts	$58,112 40
Cash on hand, 1906	106 23
Bank Overdraft, 1907	1,112 79
	$59,331 42

Expenditures.

Teachers' Salaries	$3,125 00
Other Salaries	508 54
Fuel Supplies, etc.	433 78
Repairs	86 95
Examinations	17 35
Printing, Stationery, etc.	17 32
Insurance	212 00
School Building	4,608 53
Sundries	30 25
Bills Payable, Traders Bank	49,636 70
Interest	655 00
	$59,331 42

PUBLIC SCHOOL CASH STATEMENT FOR 1906.

Receipts.

Fees	$16 00
Government Grant	283 00
Township of Springer	100 00
Town of Sturgeon Falls	3,380 00
Sundries	11 00
Loans from Traders Bank	12,435 00
Total Receipts	$16,225 00

Expenditures.

Teachers' Salaries	$2,730 00
Other Salaries	423 87
Fuel Supplies, etc.	520 21
Repairs	89 15
Examinations	11 05
Printing, Stationery, etc	34 25
Equipment, Maps, etc.	114 78
Insurance	18 00
School Building	7,989 50
Sundries	266 35
Bills Payable, Traders Bank	3,720 71
Interest	200 90
Total Payments	$16,118 77
Cash on hand	106 23
	$16,225 00

Debenture issue of $12,500.00, dated July 9, 1906, was not sold until November 14, 1907, and realized $11,406.25. The Traders Bank handled the sale. This explains the large loan from Traders Bank as shown above.

STURGEON FALLS, ONT.

STATEMENT OF SCHOOL TAXES LEVIED AND PAID OVER.

PUBLIC SCHOOL.

Year.	Levy.	Date of requisition.	Amount of requisition.	Paid on requisition by Town Council.
	$ c.		$ c.	$ c.
1903	2,777 79	July 14	2,500 00	2,015 18
1904	3,002 72	Aug. 8	3,000 00	3,297 04
1905	3,380 13	Sept. 7	3,500 00	1,290 00
1906	5,371 57	" 17	5,000 00	3,380 00
1907	4,386 07	Aug. 5	6,000 00	4,000 00
1908	6,825 47	" 3	6,000 00	4,086 07
1909	8,772 38	" 9	6,700 00	1,000 00
Total	34,516 13		32,000 00	19,068 29

Paper Mills Company's taxes as levied and as settled. Imperial Land Company's taxes as levied and as settled. See statements and papers attached. This is very largely the cause of all the trouble and shortage of funds.

SEPARATE SCHOOL.

Year.	Levy.	Paid by Town Council.
	$ c.	$ c.
1903	1,460 64	1,304 85
1904	2,100 06	1,860 64
1905	2,618 50	500 00
1906	2,451 64	2,618 50
1907	3,058 04	3,250 00
1908	3,961 80	3,858 04
1909	4,101 49	4,653 20
Total	19,752 17	18,045 23

A leading member of the Separate School Board (chairman for several years), who has been Mayor and Councillor, informed me there had never been a formal requisition made for the amount necessary to conduct their affairs. They advised the Council what money they required from their supporters, and the town levied accordingly. I went through their minute books, but could find no trace of there ever having been made such. He further informed me the School Board would be perfectly willing to accept as their just dues the amount of the levy.

Copy of a Resolution passed by the Public School Board at a regular meeting held June 23rd, 1903:

Moved by Trustee Thomas G. S. McAmmond, seconded by Trustee Samuel Pierce, "That the Chairman and Treasurer be authorized to borrow from the Traders Bank whatever moneys are required for school purposes from time to time." Carried.

(Sd.) L. E. BOLSTER,

Chairman.

I hereby certify the above to be a true copy of a Resolution passed by the Public School Board at a regular meeting held on Tuesday, June 23, 1903.

(Seal) HENRY U. GILL,
Secretary P. S. B.

Agreement made in duplicate this 7th day of Jan., 1910, between the Traders Bank of Canada, hereinafter called the Bank of the First Part, and the Board of Public School Trustees, for the School Section No. 1 of the Town of Sturgeon Falls in the District of Nipissing, hereinafter called the Board of the Second Part.

Whereas on the 25th day of November, 1909, the Said Bank did recover Judgment in the High Court of Justice against the Said Board for the amount of the indebtedness of the Said Board to the Said Bank:

And whereas the Said Bank on the Said 25th day of November, 1909, did issue and file with the Sheriff of the District of Nipissing a Writ of *fieri facias,* directing the Said Sheriff to levy the amount of the Said Judgment;

And whereas on the Said 25th day of November, 1909, the Said Bank obtained from J. A. Valin, Esquire, Local Judge of the High Court of Justice at North Bay, an Attaching Order attaching all debts owing or accruing due from the Corporation of the Town of Sturgeon Falls to the Said Board, to answer Judgment recovered by the Said Bank against the Said Board;

And whereas the Local Judge of the High Court of Justice at North Bay has adjourned the application of the Said Bank for judgment under Said Attaching Order from time to time, on the understanding that the Said Bank would endeavour to arrive at a settlement of all matters in dispute;

And whereas the Said Bank and the Said Board have this day arrived at a settlement on the terms and conditions following:

Now this agreement therefore witnesseth that in consideration of the premises and the sum of one dollar paid by the Said Board to the Said Bank (the receipt of which is hereby acknowledged), and in consideration of the sum of one dollar paid by the Said Bank (the recipt of which is hereby acknowledged), it is agreed by and between the Said Bank and the Said Board as follows:

It is agreed by and between the Said Bank and the Said Board that the Judgment recovered by the Said Bank against the Said Board on the 25th day of November, 1909, shall be and remain in full force and virtue until fully satisfied by payment.

It is further agreed that there is due by the Said Board to the Said Bank on the said judgment up to the present date the sum of $6,709.28.

It is further agreed that the Board shall pay to the Bank on account of the said sum of $6,709.28, owing by the Said Board to the Said Bank as aforesaid, immediately upon the execution of this agreement, the sum of $800.00, to be paid out of the first $1,600.00 received from the Town Council out of the money at present lodged in the Traders Bank, and it is further agreed that the Bank will join the Board in urging the Council to pass this order for $1,600.00 forthwith.

It is further agreed by and between the Said Board and the Said Bank that the Said Board shall pay to the Said Bank one-third of all the moneys hereafter received by the Said Board as soon as the Said Board receives the same, said payments to be continued until all sums due by the Said Board to the Said Bank are fully paid and satisfied.

It is further agreed that the Said Board shall pay to the Said Bank from and after this date interest at the rate of seven per cent. per annum on all sums from time to time remaining unpaid, until all sums due by the Said Board to the Said Bank shall have been fully paid and satisfied.

The Bank agrees with the Said Board to withdraw the attaching order forthwith after the execution of this agreement and payment of $800.00 above mentioned, and to stay proceedings upon the said judgment and execution filed with the Sheriff so long as the Said Board fulfil and satisfy the terms of this agreement and make the payments as above specified, according to the true interest and meaning of this agreement.

In witness whereof the Said Bank and the Said Board have executed these presents.

Witness.

(Sd) E. G. LEVESQUE,
Witness to signature of
L. J. Gilleland.

(Sd.) THE TRADERS BANK OF CANADA,
L. J. GILLELAND,
Manager, Sturgeon Falls. (Seal)

(Sd.) H. A. HAMILTON.

(Sd.) L. E. BALSTER,
Chairman.
(Sd.) W. C. PARLIAMENT,
Secretary.
(Seal of the Public School Board. Sturgeon Falls.)

In the matter of an arbitration between the Board of the Separate School Trustees of the said School Section and the Board of the Public School Trustees for School Section One of the Town of Sturgeon Falls, under an Act respecting Schools in the Town of Sturgeon Falls, R.S.O., 4 Ed. 7, Chapter 69:

To all whom these presents shall come, I, Joseph Alphonse Valin, of the Town of North Bay, in the District of Nipissing, Judge of the District Court of the Provisional Judicial District of Nipissing, send greeting:

Whereas it was provided by R.S.O., 4 Ed. 7, Chap. 69, "That in case any dispute shall arise between the Boards of Public School Trustees and Separate School Trustees as to the amount of taxes payable from time to time under the provisions of the Said Act, the same shall be determined by Arbitration by the Judge of the District Court of the Provisional Judicial District of Nipissing, sitting as Sole Arbitrator;

And whereas difficulties have arisen between the parties hereto in respect of the taxes payable from time to time under the provisions of the Said Act;

And whereas on the 19th day of June, A.D. 1909, at the request of the Board of Separate School Trustees of Sturgeon Falls, I did appoint Thursday, the 19th day of August, 1909, at the Court House in the Town of North Bay at 11 o'clock in the forenoon for the hearing and adjudicating upon all questions and matters provided for under the said Act.

And whereas notices of the said appointment were served upon the Board of Public School Trustees and upon the members of the Municipal Corporation of the Town of Sturgeon Falls.

And whereas did appear before me on the 19th day of August, 1909, Counsel representing the said Board of Public Schools the said Board of Separate School Trustees and the Municipal Corporation of the Town of Sturgeon Falls.

And whereas I did on request of Counsel for the Board of Separate School Trustees adjourn the hearing of the questions and matters in dispute to Thursday the 9th day of September, 1909, and Counsel for and representing the Said Board

of Public School Trustees and the said Board of Separate School Trustees and the Municipal Corporation of the Town of Sturgeon Falls did appear before me on said date.

Now know you that I, the said Joseph Alphonse Valin, have taken upon myself the burthen of the said arbitration, and having heard and duly considered all the allegations and evidences of the respective parties of and concerning the said matters in difference and so referred as aforesaid, do make and publish this my award in writing of and concerning the matters referred to me, and do hereby award that the Public School Board of the Town of Sturgeon Falls should pay to the Separate School Board of the Town of Sturgeon Falls the sum of $882.88, being one-half of the amount paid for school taxes by the Sturgeon Falls Pulp Co. or their successors upon an assessment up to $40,000.00 for the years 1899, 1900, 1901, 1902, 1903, 1907, on the Pulp Mills and other premises in connection therewith used or operated by the said company.

I do further award that the Public School Board do pay the Separate School Board the sum of $314.79 for interest on amounts found due the Board of the Separate School Trustees during each part of the said years, according to the following schedule for the years:

899.....	Interest	on	one	half	of	$345 75	from	January	1, 1900 to September 9, 1909	$83 75
900.....	"	"	"			240 00	"	"	1, 1901 " "	52 12
901.....	"	"	"			320 00	"	"	1, 1902 " "	61 53
902.....	"	"	"			360 00	"	"	1, 1903 " "	60 24
1903.....	"	"	"			360 00	"	"	1, 1904 " "	51 24
1907.....	"	"	"			140 00	"	"	1, 1908 " "	5 91
										$314 79

I do further award that this finding does not cover the years 1904, 1905, 1906, and 1908, as I find that the taxes for these years have not been paid by the Sturgeon Falls Pulp Co., or their successors, and my finding herein is without prejudice to the right of the Board of Separate School Trustees to take whatever action they may be advised as to their claim for a proportionate part thereof of the taxes under the said Act for the said years of 1904, 1905, 1906 and 1908 when the said taxes shall have been paid.

I do further award that the amount of $1,197.67 found due be paid in 60 days from the day of this award at the office of the Treasurer of the Separate School Board of Sturgeon Falls at Sturgeon Falls.

I do further award that each of the parties hereto pay their own costs of this arbitration, provided that should any appeal be taken by the Board of Public School Trustees then the Board of Separate School Trustees are to have their costs of this arbitration with a set-off of one day's costs to the Board of Public School Trustees for the hearing of August 29th, 1909.

In witness whereof I have hereunto set my hand and seal the ninth day of September, A. D., 1909.

Witness,

(Sgd.) THOS. J. BOURKE.

(Sgd.) J. A. VALIN,
Arbitrator.
(Seal).

BALANCE SHEET OF CURRENT LIABILITIES AND AVAILABLE ASSETS.

December 31, 1909.

Current Liabilities.

Public School, as per statement	$12,931 71		
Separate School, as per statement	1,706 94		
Traders Bank, loan and interest	18,464 67		
Imperial Paper Mills, two years' pumping	3,000 00		
		$36,103 32	
Deficit from permanent balance sheet		$38,464 70	
			$74,568 02

Available Assets.

Balance of Taxes, Roll, 1909	$16,634 65		
Arrears of Taxes, Roll, 1909	2,223 11		
Paper Mills Taxes, 1908-1909, as per statement	8,896 08		
Paper Mills Taxes, as per award	4,957 50		
Paper Mills Taxes, Interest on award to Dec. 12, 1909	347 70		
Imperial Land Co.'s Taxes, 1906-7-8-9	6,473 31		
Imperial Land Co's Taxes, Percentage added	249 52		
Imperial Land Co.'s Taxes, Interest on Notes	206 73		
Water Works, Arrears due not collected	48 34		
Provincial Government Liquor License Distribution	511 70		
Cash in Bank	$4,471 29		
Less o-s Cheques	56 86		
	$4,414 43		
Cash on hand	5 00		
	4,419 43		
		$44,968 07	

Transient Assets.

Water Works Tools and Equipment	$2,759 00		
Fire Department Equipment	1,500 00		
Town Band Instruments	300 00		
		$4,559 00	
Deficiency		25,040 95	
			74,568 02

STURGEON FALLS, ONTARIO.

IMPERIAL PAPER MILLS TAXES, AS SHOWN IN ROLLS, AND AS SETTLED.

By agreement dated September 30th, 1902, the town agrees to pay the Paper Mills Company, $1,500.00 per annum for pumping water into the town mains. This agreement came into force on January 1st, 1903. The amount $1,500.00, to be paid to the Company before the 31st of December, in each and every year for ten years, the life of the agreement.

Year.	Town Levy.	General Debentures.	Public School Debentures.	Public School General.	Separate School General.	Arrears.	Total.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1903	2,005 00	1,704 26	804 96	1,793 25	21 25	.....	6,328 72

This was settled in full by a cash payment of $2,791.23 and one year's pumping = $4,291.23.

1904	2,635 88	2,115 80	456 00	1,813 53	15 50	.....	7,036 71
1905	3,729 63	4,046 83	397 31	2,225 48	28 70	.....	10,427 95
1906	4,660 50	3,301 28	388 40	2,324 93	12 43	.....	10,687 54
	11,026 01	9,463 91	1,241 71	6,363 94	56 63	.....	28,152 20

This was settled in full by an award given by the official Referee, on August 14th, 1908, for the sum of $4,957.50 with an off-set of $6,000.00 for 4 years

pumping, $10,957.50. The Town by By-law and agreement (copy attached), extended the time of payment for 2 years, making it fall due on August 14th, 1910, and assigned the award to the Trader's Bank, who now hold it as collateral.

1907	4,404 06	2,813 36	366 93	2,568 73	489 24	.....	10,642 32

This was settled in full by agreement and the Company paid on March 9th, and April 1st, 1908, $4,761.33 and one year's pumping = $6,261.33.

1908	4,845 73	3,230 42	807 61	3,230 42	.....	15 75	12,114 18
1909	3,029 41	3,029 41	1,081 93	3,029 41	.....	.....	10,185 91
	7,875 14	6,259 83	1,889 54	6,259 83	.....	15 75	22,300 09

This was appealed from the Railway and Municipal Board's decision to the Court of Appeal. An agreement has been arrived at, and subject to confirmation is to be settled and said to be paid some time in February, 1910. No copies of the Proceedings or agreement are in possession of the Municipal authorities at Sturgeon Falls, but the Town Clerk supplied me with a statement on which the settlement had been made. These figures are herewith shown:—

Statement of Receiver's Taxes, as per Agreement November, 1909.

	Value of Property.	Public School Levy.	Town Levy, ¼ of General Levy.	Total.
Year 1908.	$	$ c.	$ c.	$ c.
Lands	22,150	112 25	53 35	167 60
Northern Sulphite Mills.	194,670	973 35	486 68	1,460 03
Pulp Mills, Paper Mills, Wood Yard, Cutting up Mill	257,140	1,285 70	303 95	1,589 65
		2,371 30	845 98	3,217 28
Year 1909.				
Lands	21,550	205 07	75 67	280 74
Northern Sulphite Mills.	194,670	1,849 36	681 34	2,530 70
Pulp Mills	98,220	933 09	343 77	1,276 86
Wood Yard, Cutting up Mills	23,360	221 92	81 76	303 68
Paper Mills	135,560	1,286 82	.....	1,286 82
		4,496 26	1,182 54	5,678 80
		2,371 30	845 98	3,217 28
Total		6,867 56	2,028 52	8,896 08

From this will be deducted in settlement $3,000.00, being two years pumping which the town now owes to the Company.

The absence of a fixed assessment, or of any kind of an agreement between the town and this Company, as to how the properties are to be assessed has been one long trouble. Appeals innumerable on every assessment have resulted in consequence. One Council orders one method of assessment which is never accepted by the Company, and the next Council has a different assessment which is also appealed against. At present there is an agreement which is now in the hands of the High Court of Justice. It has been signed by the Receiver, also by the Council,

and ratified by the Council, and has been sent to Toronto for ratification. When this is done, probably there will be less trouble in future as to the determining of the Company's taxes.

IN THE HIGH COURT OF JUSTICE.

J. A. McANDREW
Official Referee.

Friday, the 14th day of August A.D., 1908.

Between Adalph Diehl and Alfred S. Magg suing on behalf of themselves and all other Bondholders of the Defendant Company, the Imperial Paper Mills of Canada, Limited, Plaintiff, and Thos. Carritt, and David Sinclair, the Trustees Executors and Security Insurance Corporation Limited, and the Imperial Paper Mills of Canada, Limited, Defendant.

Upon the application of the plaintiff, upon hearing read the affidavit of E.R. C. Clarkson, the executor, therein referred to, and the other proceedings had and taken herein, and upon hearing what was alleged on behalf of the Said Applicants.

1. It is ordered that the Receiver be at liberty to borrow the sum of $4,957.50, being the amount due by the Imperial Paper Mills of Canada, Limited, to the Municipal Corporation of the Town of Sturgeon Falls, for arrears of Taxes.

2. And it is further ordered that the Said Amount be a first Charge on the Assets of the Said, the Imperial Paper Mills of Canada, Limited, prior to the debentures but subsequent to any sums which have already been given priority in this Action to Said debentures.

(Sgd.) J. A. McANDREW,
Official Referee.

BY-LAW 242.

A by-law to authorize the Head and Treasurer of the Corporation of the Town of Sturgeon Falls, Ontario, Canada, to assign to the Traders Bank of Canada, as collateral security to present or future unpaid advances by the Traders Bank to the Town of Sturgeon Falls, all the right, title and interest of the Town of Sturgeon Falls in a certain order of the Court granted on August 14, 1908, to E.R.C. Clarkson, receiver of the Imperial Paper Mills of Canada, for the sum of $4957.50 for arrears of taxes due the Town of Sturgeon Falls, Ont., by the Imperial Paper Mills of Canada, Limited.

Whereas the Imperial Paper Mills of Canada, Limited, are indebted to the Town of Sturgeon Falls, Ont., in the sum of $4,957.50, for arrears of taxes, and whereas the said Imperial Paper Mills of Canada, Limited, is in the hands of a Receiver appointed under the High Court of Justice and whereas the Receiver has received the authority of the Court to make the above mentioned arrears of taxes of the Town of Sturgeon Falls amounting to $4,957.50 a first charge on the assets of the Imperial Paper Mills of Canada, Limited, prior to the debentures and subsequent to any sums which already have been given priority to the debentures, and whereas the Town of Sturgeon Falls is indebted to the Traders Bank of Canada. Be it therefore enacted by the Municipal Council of the Town of Sturgeon Falls, as follows:—

1st. That the Head and Treasurer of the said Corporation be and they are duly authorized under the seal of the Corporation to borrow from the Traders

Bank of Canada $4,957.50, and to assign to the Traders Bank of Canada all the right, title and interest of the Town of Sturgeon Falls, Ontario, Canada, in the award against the Imperial Paper Mills of Canada, Limited, and further to assign to the Traders Bank of Canada, Limited, all right, title and interest in the order of the High Court of Justice granted to E.R.C. Clarkson as Receiver of the Imperial Paper Mills of Canada, Limited, whereby the sum of $4,957.50 was made a charge against the assets in his hands as Receiver as above mentioned.

2nd. That the sum so borrowed be used to liquidate the present unsecured advances of the Town of Sturgeon Falls, Ontario, to the extent of the sum so borrowed, viz.: $4,957.50, and that said assignment be a continuing collateral to the advances of the town while they are in any way indebted to the Traders Bank of Canada.

Passed in Open Council this third day of September, A.D., 1908.

(Sgd.) J. D. Cockburn,
Clerk.

(Sgd.) Napoleon Ray.
Mayor.
(Seal).

CORPORATION OF THE TOWN OF STURGEON FALLS.

Sturgeon Falls, August 6, 1908.

E. R. C. Clarkson, Esq.,
Receiver Imperial Paper Mills,
Toronto, Ontario.

Dear Sir,—In consideration of your obtaining an order of the Court making the arrears of Taxes, amounting to $4,957.50 with interest, which is owing by the Imperial Paper Mills to the town, a charge on the assets of the Imperial Paper Mills in priority to the bonds, so as to secure to the town the payment thereof, the town will agree to waive payment thereof until the assets in your hands, as received, have been disposed of, and the authority of the Court is received, for payment of the receiver's liabilities, or in case a sale of the properties is not made, then, until such time as there shall be a re-organization of the Company on such terms as will permit the payment of the said amounts in cash; the payment, however, not to extend beyond 2 years, it being further agreed that you shall not be held personally liable for the amount, but that the town shall look to the assets in your hands as receiver for payment.

Yours truly,

(Sgd.) N. Ray,
Mayor.

(Sgd.) J. D. Cockburn,
Clerk.

IMPERIAL LAND COMPANY LIMITED, UNPAID TAXES.

—	Town levy.	General Debentures.	Public School Debentures.	Public School General.	Separate School General.	Local improvements sewers.	Local improvements sidewalks.	Total.
	£ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1908	549 07	354 71	91 14	365 71	....	99 01	15 35	1,474 99
1909	552 57	554 56	197 07	554 56	.. ..	130 25	51 38	2,040 39
Total...	1,101 64	909 27	288 21	920 27	....	229 26	67 73	3,515 38
1906	579 60	411 86	124 21	279 60	32 20	205 16	.....	1,632 63
1907	590 98	369 86	97 51	317 38	46 87	153 66	56 78	1,633 04
Total...	1,170 58	781 72	221 72	596 98	79 07	358 82	56 78	3,235 67

Taxes for 1906 and 1907 were settled on September 1, 1908, by the Company giving notes for $2,957.93 at 3 months, bearing 6 per cent. interest. Some concessions to amount of $297.74 were given by the Council to the Company at the time of the above settlement. The notes were not paid, and there being no prospect of obtaining a settlement, the Council forced the Company into liquidation, as things now stand the Company owes the notes and accrued interest, and taxes for 1908 and 1909. Without taking into account the interest or the 5 per cent. added for unpaid taxes the insolvent Company owes the Town for 1906, 1907, 1908, and 1909, $6,473.31. Copy of notes attached.

BALANCE SHEET OF PUBLIC ENTERPRISES AND OBLIGATIONS THEREON.

December 31, 1909.

Liabilities.

Debentures unmatured			$123,494 31
Water Works, By-law 54 A		$16,213 44	
Sewers, By-law 106	$17,548 84		
Sewers, By-law 177	20,047 62		
		37,596 46	
Bonus to Pulp Co., By-law 130		2,850 99	
Consolidation Debt, By-law 169		18,702 43	
Municipal Buildings, By-law 168		14,026 92	
Local Improvements, By-law 196	$157 27		
Local Improvements, By-law 197	6,299 26		
Local Improvements, By-law 198	9,773 99		
		16,230 52	
Public Schools, By-law 79,	$6,665 30		
Public Schools, By-law 179	11,208 25		
		17,873 55	
		$123,494 31	
Ratepayers' Investment			$36,016 61
Town Funds used on construction—			
Water Works		$24,775 47	
Sewers		11,241 14	
		$36,016 61	
General Debentures Redeemed			9,237 85
Water Works		$3,485 53	
Bonus to Pulp Co		3,481 62	
Consolidation Debt		1,297 60	
Municipal Buildings		973 10	
		$9,237 85	
Local Debentures redeemed			11,806 65
Sidewalks		$1,319 33	
Sewers		3,449 82	
Public Schools		7,037 50	
		$11,806 65	
			$180,555 42

Permanent Assets.

Expended upon General Works			$46,593 04
Water Works—			
Debenture Moneys		$19,600 45	
Town Funds		24,775 47	
		$44,375 92	
Municipal Buildings—			
Debenture Moneys		2,217 12	
Expended upon Local Works			64,154 02

Sidewalks—			
Debenture Moneys	$11,578 37		
Sewers—			
Debenture Moneys	$41,334 51		
Town Funds	11,241 14		
	$52,575 65		
Speculative		6,332 61	
Bonus to Pulp Co.—			
Debenture Moneys	$6,332 61		
Loans		25,011 05	
Board of Public School for school erection—			
Debenture Moneys	$25,011 05		
		$142,090 72	
Deficit carried to current balance sheet		38,464 70	
			$180,555 42

WATER WORKS.

Capital Account.

1901	To Cash	$8,884 09	By-law 54 A, Nov. 30, 1900. Issue of $20,000.00 30-year debentures, 5 per ceit. interest. See account and detail of this, the only issue attached.	
1902	"	2,316 56		
1903	"	12,073 61		
1904	"	7,032 44		
1905	"	4,437 53	Total Debenture Moneys	$19,600 45
1906	"	7,033 48	Total Town Funds	24,775 47
1907	"	2,598 21		
1908-09	"	.....		
		$44,375 92		$44,375 92

WATER WORKS.

Maintenance Account.

1903	To Cash	$1,134 56	By Rates Collected		$886 05
	" Pumping	1,500 00	" " "		2,242 12
1904	" Cash	2,269 33	" " "		3,210 11
	" Pumping	1,500 00	" " "		3,811 64
1905	" Cash	2,371 99	" " "		3,951 70
	" Pumping	1,500 00	" " "		3,567 53
1906	" Cash	32 23	" " "		3,148 89
	" Pumping	1,500 00	" Arrears to Dec. 31, 1909		48 34
1907	" Cash	2,313 97	" Deficiency		342 47
	" Pumping	1,500 00			
1908	" Cash	1,089 96			
	" Pumping	1,500 00			
1909	" Cash	1,496 81			
	" Pumping	1,500 00			
		$21,208 85			$21,208 85

WATER WORKS DEBENTURES MATURING DECEMBER 1, 1929.

$20.000.00.

1903.				
Dec.	To Amount Paid	$3,903 18	By Total Indebtedness	$37,730 74
	" Balance	33,827 56		
		$37,730 74		$37,730 74

1904.			1904.		
Dec.	To Cash	$1,301 06	Jan.	By Balance	$33,827 56
"	Balance	32,526 50			
		$33,827 56			$33,827 56
1905.			1905.		
Dec.	To Cash	$1,301 06	Jan.	By Balance	$32,526 50
"	Balance	31,225 44			
		$32,526 50			$32,526 50
1906.			1906.		
Dec. 6.	To Cash	$1,301 06	Jan.	By Balance	$31,225 44
1907.					
Jan. 11.	" Balance	29,924 38			
		$31,225 44			$31,225 44
1907.			1907.		
Dec. 6.	To Cash	$1,301 06	Jan.	By Balance	$29,924 38
" 17.	" Balance	28,623 32			
		$29,924 38			$29,924 38
1908.			1908.		
Dec. 11.	To Cash	$1,301 06	Jan.	By Balance	$28,623 32
"	Balance	27,322 26			
		$28,623 32			$28,623 32
1909.			1909.		
Dec. 7.	To Cash	$1,301 06	Jan.	By Balance	$27,322 26
"	Balance	26,021 20			
		$27,322 26			$27,322 26
			1910.		
			Jan.	By Balance	$26,021 20

$20,000.00 Water Works Debentures issued in 1900 for 30 years at 5 per cent. interest. Annual levy authorized by By-law, $1,301.06. Sold June 17, 1901, to E. A. Bremner, and taken up by Clarke, Bowes & Swabey, Barristers, Toronto, price 99½ per cent. Amount received, $19,600.45. Debenture No. 1, being overdue before the sale was made, was not sold with the others. The first coupons were therefore not paid, and the total liability of the municipality, for 29 years from 1901 to 1929, is

29	Debentures	$19,698 94
29	Years' Coupons	18,031 80
		$37,730 74

——	Maturity.	Amount.	Each year's coupons total	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law No. 54, A. Nov. 30, 1900.	Dec. 1, 1901	316 11	984 95	1,301 06	Dec. 9, 1901
	1902	331 92	969 14	1,301 06	3, 1902
	1903	348 51	952 55	1,301 06	1903
	1904	365 93	935 13	1,301 06	1904
	1905	384 23	916 83	1,301 06	Dec. 1905
	1906	403 43	897 63	1,301 06	Dec. 6, '06, Jan. 11, '07
	1907	423 60	877 46	1,301 06	Dec. 6, '07, Dec. 17, '0[illegible]
	1908	444 78	856 28	1,301 06	Dec. 11, 1908
	1909	467 02	834 04	1,301 06	Dec. 7, 1909
	1910	490 36	810 70	1,301 06	
	1911	514 88	786 18	1,301 06	
	1912	540 62	760 44	1,301 06	
	1913	567 65	733 41	1,301 06	
	1914	596 03	705 03	1,301 06	
	1915	625 82	675 24	1,301 06	
	1916	657 11	643 95	1,301 06	
	1917	689 96	611 10	1,301 06	
	1918	724 45	576 61	1,301 06	
	1919	760 67	540 39	1,301 06	
	1920	798 70	502 36	1,301 06	
	1921	838 64	462 42	1,301 06	
	1922	880 57	420 49	1,301 06	
	1923	924 59	376 47	1,301 06	
	1924	970 82	330 24	1,301 06	
	1925	1,019 36	281 70	1,301 06	
	1926	1,070 32	230 74	1,301 06	
	1927	1,123 84	177 22	1,301 06	
	1928	1,180 03	121 03	1,301 06	
	1929	1,239 02	62 04	1,301 06	
		19,698 94	18,031 80	37,730 74	

SEWERS.

1900	To Cash	$3,628 42	By-law 106, Sept. 9, 1902, Issue of $20,000.00 30-year debentures at 5 per cent. interest, realized $20,310.96.	
1901	"	3,805 11		
1902	"	831 33		
1903	"	9,266 05	By-law 177, Feb. 7, 1906, Issue of $21,046.25 30-year debentures at 5 per cent. interest, realized $21,023.55.	
1904	"	15,147 34		
1905	"	12,428 37		
1906	"	2,927 30	See accounts and details of these issues attached.	
1907	"	3,034 33		
1908	"	508 77	Total Debenture Moneys	$41,334 51
1909	"	998 63	Total Town Funds	11,241 14
		$52,575 65		$52,575 65

SEWERAGE DEBENTURES, MATURING SEPTEMBER 9, 1932.

$20.000.00.

1903.				
Dec.	To Amount Paid	$1,301 06	By Total Indebtedness	$39,031 80
	" Balance	37,730 74		
		$39,031 80		$39,031 80
1904.			1904.	
Sept. 12.	To Cash	$1,301 06	Jan. By Balance	$37,730 74
Dec.	" Balance	36,429 68		
		$37,730 74		$37,730 74

1905.			1905.		
Sept. 14.	To Cash	$348 52	Jan.	By Balance	$36,429 68
Dec.	" Balance	36,081 16			
		$36,429 68			$36,429 68
1906.			1906.		
April 5.	To Cash	$952 53	Jan.	By Balance	$36,081 16
Sept. 10.	" Cash	1,301 06			
Dec.	" Balance	33,827 57			$36,081 16
		$36,081 16			
1907.			1907.		
Mar. 7.	To Cash	$1,301 06	Jan.	By Balance	$33,827 57
Dec.	" Balance	32,526 51			$33,827 57
		$33,827 57			
1908.			1908.		
Oct. 19.	To Cash	$1,301 06	Jan.	By Balance	$32,526 51
Dec.	" Balance	31,225 45			$32,526 51
		$32,526 51			
1909.			1909.		
Oct. 11.	To Cash	$1,301 06	Jan.	By Balance	$31,225 45
Dec.	" Balance	29,924 39			$31,225 45
		$31,225 45			
			1910.		
			Jan.	By Balance	$29,924 39

$20,000.00 Sewerage Debentures of 1902, 30 years. 5 per cent. Annual levy, $1,301.06.

Sold April 27, 1903: Coupons to Imperial Bank, Ottawa; Debentures to W. J. Gormon, Ottawa. Price, par, $20,000.00, with 7½ months' interest from Sept. 9, 1902, $310.96.

——	Maturity.	Amount.	Each Year's Coupons Total.	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law	Sept. 9, 1903	301 06	1,000 00	1,301 06	September 9, 1903.
No. 106	1904	316 11	984 95	1,301 06	" 12, 1904.
Sept. 9, 1902	1905	331 92	969 14	1,301 06	" 14, 1905. April 5, 1906.
	1906	348 51	952 55	1,301 06	September 10, 1906.
	1907	365 93	935 13	1,301 06	November 7, 1907.
	1908	384 23	916 83	1,301 06	October 19, 1908.
	1909	403 43	897 63	1,301 06	" 11, 1909.
	1910	423 60	877 46	1,301 06	
	1911	444 78	856 28	1,301 06	
	1912	467 02	834 04	1,301 06	
	1913	490 36	810 80	1,301 06	
	1914	514 88	786 18	1,301 06	
	1915	540 62	760 44	1,301 06	
	1916	567 65	733 41	1,301 06	
	1917	596 03	705 03	1,301 06	
	1918	625 82	675 24	1,301 06	
	1919	657 11	643 95	1,301 06	
	1920	689 96	611 10	1,301 06	
	1921	724 45	576 61	1,301 06	
	1922	760 67	540 39	1,301 06	
	1923	798 70	502 36	1,301 06	
	1924	838 64	462 42	1,301 06	
	1925	880 57	420 49	1,301 06	
	1926	924 59	376 47	1,301 06	
	1927	970 82	330 24	1,301 06	
	1928	1,019 36	281 70	1,301 06	
	1929	1,070 32	230 74	1,301 06	
	1930	1,123 84	177 22	1,301 06	
	1931	1,180 03	121 03	1,301 06	
	1932	1,239 02	62 84	1,301 06	
		20,000 03	19,031 77	39,031 80	

SEWER CONSTRUCTION DEBENTURES, MATURING FEBRUARY 7, 1936.

$21,046 25.

1907.					
March 18.	To Cash	$1,369 09	By Total Indebtedness	$41,072 70	
Dec.	" Balance	39 703 61			
		$41,072 70			$41,072 70
1908.			1908.		
March 16.	To Cash	$1,369 09	Jan. By Balance	$39,703 61	
Dec.	" Balance	38,334 52			
		$39,703 61			$39,703 61
1909.			1909.		
March 16.	To Cash	$1,369 09	Jan. By Balance	$38,334 52	
Dec.	" Balance	36,965 43			
		$38,334 52			$38,334 52
			1910.		
			Jan. By Balance	$36,965 43	

$21,046.25 Sewer Construction Debentures of 1906. 30 years, 5 per cent. interest. Annual levy, $1,369,09. Price, $21,023.55.

——	Maturity.	Amount.	Each years' coupons total.	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law	Feb. 7, 1907	316 77	1,052 32	1,369 09	March 18, 1907.
No. 177,	1908	332 62	1,036 47	1,369 09	" 16, 1908.
Feb. 7, 1906.	1909	349 24	1,019 85	1,369 09	" 16, 1909.
	1910	366 71	1,002 38	1,369 09	
	1911	385 04	984 05	1,369 09	
	1912	404 30	964 79	1,369 09	
	1913	424 50	944 59	1,369 09	
	1914	445 74	923 35	1,369 09	
	1915	468 02	901 07	1,369 09	
	1916	491 43	877 66	1,369 09	
	1917	516 00	853 09	1,369 09	
	1918	541 79	827 30	1,369 09	
	1919	568 89	800 20	1,369 09	
	1920	597 32	771 77	1,369 09	
	1921	627 20	741 89	1,369 09	
	1922	658 55	710 54	1,369 09	
	1923	691 49	677 60	1,369 09	
	1924	726 05	643 04	1,369 09	
	1925	762 36	606 73	1,369 09	
	1926	800 47	568 62	1,369 09	
	1927	840 51	528 58	1,369 09	
	1928	882 52	486 57	1,369 09	
	1929	926 66	442 43	1,369 09	
	1930	972 98	396 11	1,369 09	
	1931	1,021 64	347 45	1,369 09	
	1932	1,072 71	296 38	1,369 09	
	1933	1,126 36	242 73	1,369 09	
	1934	1,182 67	186 42	1,369 09	
	1935	1,241 81	127 28	1,369 09	
	1936	1,303 90	65 19	1,369 09	
		21,046 25	20,026 45	41,072 70	

BONUS TO PULP CO. DEBENTURES, MATURING JULY, 1915.

$7,000.00

1903.					
July.	To Amount Paid	$2,805 50	By Total Indebtedness	$9,548 90	
Dec. 31.	" Balance	6,740 40			
		$9,548 90			$9,548 90
1904.			1904.		
July.	To Cash	$561 70	Jan. By Balance	$6,740 40	
Dec. 31.	" Balance	6,178 70			
		$6,740 40			$6,740 40
1905.			1905.		
Jany.	To Cash	$561 70	Jan. By Balance	$6,178 70	
Dec. 31.	" Balance	5,617 00			
		$6,178 70			$6,178 70
1906.			1906.		
Feb. 6.	To Cash	$561 70	Jan. By Balance	$5,617 00	
Dec. 31.	" Balance	5,055 30			
		$5,617 00			$5,617 00
1907.			1907.		
Feb. 9.	To Cash	$561 70	Jan. By Balance	$5,055 30	
Dec. 31.	" Balance	4,493 60			
		$5,055 30			$5,055 30
1908.			1908.		
March 16.	To Cash	$567 35	Jan. By Balance	$4,493 60	
Dec. 31.	" Balance	3,931 90	" Interest added	5 65	
		$4,499 25			$4,499 25
1909.			1909.		
Feb. 2.	To Cash	$561 70	Jan. By Balance	$3,931 90	
Dec. 31.	" Balance	3,370 20			
		$3,931 90			$3,931 90
			1910.		
			Jan. By Balance	$3,370 20	

$7,000.00 Bonus to Pulp Co. Debentures issued by Township of Springer in 1895 for 20 years at 5 per cent. Annual levy authorized by By-law, $561.70. Nos. 1-3, aggregating $667.39, were not issued to the Pulp Co., being overdue before arrangements were finally completed. Nos. 4-20, aggregating $6,332.61, were handed over to the Pulp Co. in accordance with resolution of Council, January 18, 1899. Pulp Co. sold them. By agreement with the Township of Springer these debentures are to be delivered to the Reeve as soon as they are paid and cancelled.

——	Maturity.	Amount.	Each year's coupons total	Total payments.	Paid.
		$ c.	$ c.	$ c.	
Township of	4 July 15, 1899	245 07	316 63	561 70	Jan. 28, 1899.
Springer.	5 " 1900	257 32	304 38	561 70	" 29, 1900.
By-law 130.	6 " 1901	270 20	291 50	561 70	Feb. 5, 1901.
July 15, 1895.	7 " 1902	283 71	277 99	561 70	Jan. 22, 1902.
	8 " 1903	297 85	263 85	561 70	July, 1903.
	9 " 1904	312 78	248 92	561 70	" 1904.
	10 " 1905	328 41	233 29	561 70	Jan. 1905.
	11 " 1906	344 83	216 87	561 70	Feb. 6, 1906.
	12 " 1907	362 08	199 62	561 70	" 9, 1907.
	13 " 1908	380 18	181 52	561 70	Mar. 16, 1908.
	14 " 1909	399 19	162 51	561 70	Feb. 2, 1909.
	15 " 1910	419 15	142 55	561 70	
	16 " 1911	440 11	121 59	561 70	
	17 " 1912	462 11	99 59	561 70	
	18 " 1913	485 22	76 48	561 70	
	19 " 1914	509 48	52 22	561 70	
	20 " 1915	534 92	26 78	561 70	
		6,332 61	3,216 29	9,548 90	

CONSOLIDATION DEBT DEBENTURES, MATURING JULY 25, 1935.

$20,000.00.

1906.					
July 25.	To Cash	$1,301 06		By Total Indebtedness	$39,033 80
Dec.	" Balance	37,732 74			
		$39,033 80			$39,033 80
1907.			1907.		
Dec.	To Balance	$37,732 74	Jan.	By Balance	$37,732 74
1908.			1908.		
Jan. 11.	To Cash	$1,301 06	Jan.	By Balance	$37,732 74
Nov. 12.	" "	1,301 06			
Dec.	" Balance	35,130 62			
		$37,732 74			$37,732 74
1909.			1909.		
July 27.	To Cash	$1,301 06	Jan.	By Balance	$35,130 62
Dec.	" Balance	33,829 56			
		$35,130 62			$35,130 62
			1910.		
			Jan.	By Balance	$33,829 56

$20,000.00 Consolidation Debt Debentures of 1905. 30 years, 5 per cent interest. Annual levy, $1,301.06. Price, $19,980.00.

——	Maturity.	Amount.	Each year's coupons total	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law	July 25, 1906	301 06	1,000 00	1,301 06	July 25, 1906.
No, 169.	1907	316 11	984 95	1,301 06	Jan. 11, 1908.
July 25, 1905.	1908	331 92	969 14	1,301 06	Nov. 12, 1908.
	1909	348 51	952 55	1,301 06	July 27, 1909.
	1910	365 93	935 13	1,301 06	
	1911	384 23	916 83	1,301 06	
	1912	403 43	897 63	1,301 06	
	1913	423 60	877 46	1,301 06	
	1914	444 78	856 28	1,301 06	
	1915	467 02	834 04	1,301 06	
	1916	490 36	810 70	1,301 06	
	1917	514 88	786 18	1,301 06	
	1918	540 62	760 44	1,301 06	
	1919	567 65	735 41	1,301 06	
	1920	596 03	705 03	1,301 06	
	1921	625 82	675 24	1,301 06	
	1922	657 11	643 95	1,301 06	
	1923	689 96	611 10	1,301 06	
	1924	724 45	576 61	1,301 06	
	1925	760 67	540 39	1,301 06	
	1926	798 70	502 36	1,301 06	
	1927	838 64	462 42	1,301 06	
	1928	880 57	420 49	1,301 06	
	1929	924 59	376 47	1,301 06	
	1930	970 82	330 24	1,301 06	
	1931	1,019 36	281 70	1,301 06	
	1932	1,070 32	230 74	1,301 06	
	1933	1,123 84	177 22	1,301 06	
	1934	1,180 03	121 03	1,301 06	
	1935	1,239 02	62 04	1,301 06	
		20,000 03	19,033 77	39,033 80	

MUNICIPAL BUILDINGS.

1905.	To Cash, lots	$1,002 00	By-law 168, July 25, 1905, Issue of $15,000.00 30-year debentures at 5 per cent interest, realized $14,985.00. See account and detail of this issue attached.
1906.	" " "	1,000 00	
1908.	" " Miscellaneous.	5 75	
	Apparent Surplus	12,767 88	
			Total Debenture Moneys $14,985 00
		$14,985 00	$14,985 00

MUNICIPAL BUILDINGS DEBENTURES, MATURING JULY 25, 1906.

$15,000.00.

1906.				By Total Indebtedness	$29,273 10
July 25.	To Cash	$925 77			
Dec.	" Balance	28,297 33			
		$29,273 10			$29,273 10
1907.			1907.		
Dec. 2.	To Cash	$985 86	Jan.	By Balance	$28,297 33
Dec.	" Balance	27,321 56		" Interest	10 09
		$28,307 42			$28,307 42

1908.			1908.		
Nov. 12.	To Cash	$975 77	Jan.	By Balance	$27,321 56
Dec.	" Balance	26,345 79			
		$27,321 56	1909.		$27,321 56
1909.					
July 27.	To Cash	$975 77	Jan.	By Balance	$26,345 79
Dec.	" Balance	25,370 02			
		$26,345 79			$26,345 79
			1910.		
			Jan.	By Balance	$25,370 02

$15,000.00 Municipal Buildings Debentures of 1905. 30 years, 5 per cent. interest. Price, $14,985.00. Annual levy, $975.77.

——	Maturity.	Amount.	Each year's coupons total	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law	July 25, 1906	225 77	750 00	975 77	July 25, 1906.
168.	1907	237 06	738 71	975 77	Dec. 2, 1907.
July 25, 1905.					10.09 interest added.
	1908	248 91	726 86	975 77	Nov. 12, 1908.
	1909	261 36	714 41	975 77	July 27, 1909.
	1910	274 42	701 35	975 77	
	1911	288 15	687 62	975 77	
	1912	302 55	673 22	975 77	
	1913	317 68	658 09	975 77	
	1914	333 57	642 20	975 77	
	1915	350 24	625 53	975 77	
	1916	367 76	608 01	975 77	
	1917	386 14	589 63	975 77	
	1918	405 45	570 32	975 77	
	1919	425 72	550 05	975 77	
	1920	447 01	528 76	975 77	
	1921	469 36	506 41	975 77	
	1922	492 83	482 94	975 77	
	1923	517 47	458 30	975 77	
	1924	543 35	432 42	975 77	
	1925	570 51	405 26	975 77	
	1926	599 04	376 73	975 77	
	1927	628 99	346 78	975 77	
	1928	660 44	315 33	975 77	
	1929	693 47	282 30	975 77	
	1930	728 14	247 63	975 77	
	1931	764 55	211 22	975 77	
	1932	802 78	172 99	975 77	
	1933	842 92	132 85	975 77	
	1934	885 06	90 71	975 77	
	1935	929 32	46 45	975 77	
		15,000 02	14,273 08	29,273 10	

LOCAL IMPROVEMENTS.

1904.	To Cash	$1748 71	By-law 196, April 30, 1907, Issue of $250.00 5-year debentures at five per cent. interest, realized $252 63.	
1905.	" "	2,613 20		
1906.	" "	4,656 11	By-law 197, April 30, 1907, Issue of $6,500.00 30-year debentures at 5 per cent. interest, realized $5,215.52.	
1907.	" "	2,560 35		
	Apparent Surplus	$4,284 22	By-law 198, April 30, 1907, Issue of 10,800.00 15-year debentures at 5 per cent interest, realized $10,394.44.	
			See accounts and details of these issues attached.	
			Total Debenture Moneys	$15,862 59
		$15,862 59		$15,862 59

LOCAL IMPROVEMENT DEBENTURES, MATURING JANUARY 1, 1912.

$250.00.

1908.					
March 31.	To Cash.	$57 75	By Total Indebtedness	$288 75	
Dec.	" Balance	231 00			
		$288 75		$288 75	
1909.			1909.		
Jan. 5.	To Cash	$57 75	Jan. By Balance	$231 00	
Dec.	" Balance	173 25			
		$231 00		$231 00	
			1910.		
			Jan. By Balance	$173 25	

$250.00 Local Improvement Debentures of 1907. 5 years, 5 per cent. interest. Sold to Traders Bank: price, $252.63. Annual levy, $57.75.

——	Maturity.	Amount.	Each Year's Coupons Total.	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law	Jan. 1, 1908	45 25	12 50	57 75	March 31, 1908.
No. 196	1909	47 51	10 24	57 75	January 5, 1909.
April 30, 1907.	1910	49 89	7 86	57 75	
	1911	52 38	5 37	57 75	
	1912	55 00	2 75	57 75	
		250 03	38 72	288 75	

LOCAL IMPROVEMENT DEBENTURES, MATURING JANUARY 1, 1937.

$6,500.00.

1908.					
Jan. 1.	To Cash	$422 83	By Total Indebtedness	$12,684 90	
Dec.	" Balance	12,262 07			
		$12,684 90		$12,684 90	
1909.			1909.		
Jan. 2.	To Cash	$422 83	Jan. By Balance	$12,262 07	
Dec.	" Balance	11,839 24			
		$12,262 07		$12,262 07	

$6,500.00 Local Improvement Debentures of 1907. 30 years, 5 per cent. interest. Annual levy, $422.83. Price, $5,215.52. Sold to Traders Bank, March 18, 1908, at 8 per cent. discount.

——	Maturity.	Amount.	Each Year's Coupons Total.	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law	Jan. 1, 1908	97 83	325 00	422 83	January 1, 1908.
No. 197	1909	102 73	320 10	422 83	" 2, 1909.
April 30, 1907.	1910	107 86	314 97	422 83	" 3, 1910.
	1911	113 26	309 57	422 83	
	1912	118 92	303 91	422 83	
	1913	124 86	297 97	422 83	
	1914	131 11	291 72	422 83	
	1915	137 66	285 17	422 83	
	1916	144 55	278 28	422 83	
	1917	151 77	271 06	422 83	
	1918	159 36	263 47	422 83	
	1919	167 33	255 50	422 83	
	1920	175 70	247 13	422 83	
	1921	184 48	238 35	422 83	
	1922	193 71	229 12	422 83	
	1923	203 39	219 14	422 83	
	1924	213 56	209 27	422 83	
	1925	224 24	198 59	422 83	
	1926	235 45	187 38	422 83	
	1927	247 22	175 61	422 83	
	1928	259 58	163 25	422 83	
	1929	272 56	150 27	422 83	
	1930	286 19	136 64	422 83	
	1931	300 50	122 33	422 83	
	1932	315 35	107 30	422 83	
	1933	331 30	91 53	422 83	
	1934	347 87	74 96	422 83	
	1935	365 26	57 57	422 83	
	1936	383 52	39 31	422 83	
	1937	402 70	20 13	422 83	
		6,499 82	6,184 60	12,684 90	

LOCAL IMPROVEMENT DEBENTURES, MATURING JANUARY 1, 1922.

$10,800.00.

1908.					
June 2.	To Cash	$1,040 49	By Total Indebtedness		$15,607 35
Dec.	" Balance	14,566 86			
		$15,607 35			$15,607 35
1909.			1909.		
Jan. 2.	To Cash	$1,040 49	Jan.	By Balance	$14,566 86
Dec.	" Balance	13,526 37			
		$14,566 86			$14,566 86

$10,800.00 Local Improvement Debentures of 1907. 15 years, 5 per cent. interest. Sold to Brent & Co.: price, $10,394.44. Annual levy, $1,040.49.

——	Maturity.	Amount.	Each year's coupons total	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law	Jan. 1, 1908	500 49	540 00	1,040 49	June 2, 1908.
198.	1909	525 52	514 97	1,040 49	June 2, 1909.
April 30, 1907.	1910	551 80	488 69	1,040 49	June 3, 1910.
	1911	579 39	461 10	1,040 49	
	1912	608 35	432 14	1,040 49	
	1913	638 77	401 72	1,040 49	
	1914	670 71	369 78	1,040 49	
	1915	704 25	336 24	1,040 49	
	1916	739 46	301 03	1,040 49	
	1917	776 43	264 06	1,040 49	
	1918	815 25	225 24	1,040 49	
	1919	856 02	184 47	1,040 49	
	1920	898 83	141 66	1,040 49	
	1921	943 77	96 72	1,040 49	
	1922	990 96	49 53	1,040 49	
		10,800 00	4,807 35	15,607 35	

PUBLIC SCHOOL DEBENTURE, TOWNSHIP OF SPRINGER, MATURING JULY 21, 1904.

$3,000.00.

1903.			
July. To Amount Paid	$3,496 58	By Total Indebtedness	$3,885 10
Dec. 31. " Balance	388 52		
	$3,885 10		$3,885 10
1904.		1904.	
July 29. To Cash	$388 52	Jan. 1. By Balance	$388 52

PUBLIC SCHOOL DEBENTURE, TOWNSHIP OF SPRINGER, 1894.

Debentures Sold Before the Town Was Incorporated.

——	Maturity.	Amount.	Each year's coupons total	Total.	Paid by Township of Springer.
		$ c.	$ c.	$ c.	
Township of	July 21, 1895	238 51	150 00	388 51	
Springer.	1896	250 44	138 07	388 51	
By-law 125.	1897	262 96	125 55	388 51	Aug. 17, 1897.
	1898	276 11	112 40	388 51	" 1, 1898.
Date July 21,	1899	289 91	98 60	388 51	" 2, 1899.
1894.	1900	304 41	84 10	388 51	" 6, 1900.
	1901	319 63	68 88	388 51	Sept. 17, 1901.
	1902	335 61	52 90	388 51	" 8, 1902.
	1903	352 39	36 12	388 51	July, 1903.
	1904	370 03	18 48	388 51	" 29, 1904.
		3,000 00	885 10	3,885 10	

PUBLIC SCHOOL DEBENTURES, MATURING MARCH 1, 1920.

$10,000.00.

1903.			1903.		
Dec.	To Amount Paid.	$2,407 26	By Total Indebtedness		$16,048 40
	" Balance	13,641 14			
		$16,048 40			$16,048 40
1904.			1904.		
March.	To Cash	$802 42	Jan. By Balance		$13,641 14
Dec.	" Balance	12,838 72			
		$13,641 14			$13,641 14
1905.			1905.		
March 6.	To Cash	$802 42	Jan. By Balance		$12,838 72
Dec.	" Balance	12,036 30			
		$12,838 72			$12,838 72
1906.			1906.		
March 6.	To Cash	$802 42	Jan. By Balance		$12,036 30
Dec.	" Balance	11,233 88			
		$12,036 30			$12,036 30
1907.			1907.		
March 2.	To Cash	$802 42	Jan. By Balance		$11,233 88
Dec.	" Balance	10,431 46			
		$11,233 88			$11,233 88
1908.			1908.		
March 12.	To Cash	$804 45	Jan. By Balance		$10,431 46
Dec.	" Balance	9,629 04	Interest		2 03
		$10,433 49			$10,433 49
1909.			1909.		
March 2.	To Cash	$802 42	Jan. By Balance		$9,629 04
Dec.	" Balance	8,826 62			
		$9,629 04			$9,629 04
			1910.		
			Jan. By Balance		$8,826 62

$10,000.00 Public School Debentures of 1900. 20 years, 5 per cent. interest. Annual levy, $802.42. Sold January 31, 1901, to the London Loan Company of Canada. Amount received, $9,983.00.

——	Maturity.	Amount.	Each Year's Coupons Total.	Total.	Paid.
		$ c.	$ c.	$ c.	
Town By-law No. 79.	Mar. 1, 1901	302 42	500 00	802 42	February 11, 1901.
	1902	317 54	484 88	802 42	March 24, 1902.
	1903	333 42	469 00	802 42	" 9, 1903.
	1904	350 10	452 32	802 42	1904.
	1905	367 60	434 82	802 42	March 6, 1905.
	1906	385 98	416 44	802 42	" 2, 1906.
	1907	405 28	397 14	802 42	" 2, 1907.
					$2.03 Inter't added.
	1908	425 54	376 88	802 42	March 12, 1908.
	1909	446 82	355 60	802 42	" 2, 1909.
	1910	469 16	333 26	802 42	
	1911	492 62	309 80	802 42	
	1912	517 24	285 18	802 42	
	1913	543 08	259 34	802 42	
	1914	570 24	232 18	802 42	
	1915	598 76	203 66	802 42	
	1916	628 70	173 72	802 42	
	1917	660 20	142 22	802 42	
	1918	693 20	109 22	802 42	
	1919	727 86	74 56	802 42	
	1920	764 24	38 18	802 42	
		10,000 00	6,048 40	16,048 40	

PUBLIC SCHOOL DEBENTURES, MATURING JANUARY 1, 1926.

$12,500.00.

1907.			1907.		
Nov. 14.	To Cash	$1,003 03	By Total Indebtedness		$20,060 60
Dec.	" Balance	19,057 57			
		$20,060 60			$20,060 60
1908.			1908.		
Jan. 3.	To Cash	$1,003 03	Jan. By Balance		$19,057 57
Dec.	" Balance	18,054 54			
		$19,057 57			$19,057 57
1909.			1909.		
Jan. 5.	To Cash	$1,003 03	Jan. By Balance		$18,054 54
Dec.	" Balance	17,051 51			
		$18,054 54			$18,054 54
			1910.		
			Jan. By Balance		$17,051 51

$12,500.00 Public School Debentures, of 1906. 20 years at 5 per cent. interest. Price, $11,406.25. Annual levy, $1,003.03.

——	Maturity.	Amount.	Each year's coupons total	Total.	Paid
		$ c.	$ c.	$ c.	
Town By-law 179. July 9, 1906.	Jan. 1, 1907	378 03	625 00	1,003 03	Nov. 14, 1907
	1908	396 93	606 10	1,003 03	Jan. 3, 1908
	1909	416 79	586 24	1,003 03	" 5, 1909
	1910	437 62	565 41	1,003 03	
	1911	459 50	543 53	1,003 03	
	1912	482 47	520 56	1,003 03	
	1913	506 61	496 42	1,003 03	
	1914	531 93	471 10	1,003 03	
	1915	558 52	444 51	1,003 03	
	1916	586 45	416 58	1,003 03	
	1917	615 77	387 26	1,003 03	
	1918	646 56	356 47	1,003 03	
	1919	678 89	324 14	1,003 03	
	1920	712 83	290 20	1,003 03	
	1921	748 49	254 54	1,003 03	
	1922	785 91	217 12	1,003 03	
	1923	825 19	177 84	1,003 03	
	1924	866 46	136 57	1,003 03	
	1925	909 78	93 25	1,003 03	
	1926	955 27	47 76	1,003 03	
		12,500 00	7,560 60	20,060 60	

OFFICE OF OSCAR HUDSON & CO., CHARTERED ACCOUNTANTS,.
5 King St. West, Toronto, Ontario, May, 1910.

To The Reeve and Council of the Township of Hanmer, District of Sudbury, Ont.

GENTLEMEN,—Acting under appointment from the Provincial Municipal Auditor, confirmed by an order-in-Council, dated 23rd March, 1910, the undersigned conducted an investigation into the affairs of the Township, covering a period from 1st January, 1904, to 27th April, 1910, and subjoined report deals with the results of such enquiry.

The presentation of a petition signed by 48 resident ratepayers praying for a provincial audit, was the occasion for its being granted.

The petition referred to the books of the Treasurer only without specified particulars.

The charges subsequently ascertained are reducible to those understated.

1. The tax rates had increased for Township and School purposes at an alarming rate.
2. The statements of the Treasurer did not cover all their transactions.
3. The settlement with the ex-Treasurer was not properly shown.
4. A Government grant of $781.50 has not all been accounted for.
5. The arrears of taxes are very heavy, and efforts are not being made to collect them.
6. Watercourse construction was not carried out in accordance with the regulations of the Act, levies were being objected to, and in one case refunded without authority.
7. Certain payments were illegally made.
8. Incorrect entries were made in the Treasurer's Cash Book.
9. The Minutes were not a complete record of all the proceedings.

The findings in answer to the foregoing complaints are set out in full herein, but in brief are as follows:

1. Taxes uncollected at the end of each year were a sufficient reason for levying high rates to cover the deficiency in funds, to the temporary disadvantage of those who paid.
2. The Treasurers omitted from statements and also from cash book certain receipts and also certain payments, but the result did not affect the final balance.
3. The ex-Treasurer's settlement as far as can be ascertained was correctly made, but not so shown.
4. The grant referred to was collected indirectly by the Reeve, and he apparently failed to hand over to the present Treasurer the balance of $35.50.
5. Unpaid taxes of long standing are lying in the Rolls, and collection by distraint or tax sale must be undertaken at once.
6. Procedure for watercourse work has not been very carefully followed, but the objections raised are mostly on technicalities and seem to have no weight. A refund of $25.00 was made but not authorized.
7. The grant made by Council of $50.00 for the purpose of the Congress at Ottawa, in January last is not permitted by the Municipal Act.
8. The Treasurer took credit twice for a payment of $10.00 and once for $25.00 paid out by the Reeve, and he was also found to be $112.20 short in his cash, as certified by him.
9. The Minutes were found deficient in many respects, chiefly concerning reports and correspondence.

Further findings resulted in the course of enquiry, and a synopsis of these is given.

10. Accounts were not kept with the Schools, the Loans, the Debentures, the Collectors or the Watercourses.

11. The Collectors' Rolls have had neither the Clerk's certificate or the Collector's affidavit attached; the Collectors for 1904 and 1907, 1908 and 1909, have not made proper settlements, and Council prolonged time for returns of Collector's Roll beyond the legal limit.

12. The Assessors for the various years attached no affidavits, and the Rolls were not summarized.

13. Legislation of Council was conducted by resolution instead of by By-laws.

14. Estimates were not furnished to the Council on which to base the rates.

15. Bonds have not been regularly obtained for the Collectors and Treasurers.

16. Auditors have not quite fulfilled their requirements.

17. Loans were not effected in the statutory manner.

1. Levies.

The undershown table of levies made during the six years will indicate the rising rates, even on growing Assessment values.

The arrears that remained at the close of each year are seen by gradual accumulation to have rendered necessary the succeeding higher rates imposed in order to obtain from those who did not default the sums required to meet expenditures.

This is particularly true of the School supporters, who are chiefly carrying on the arrears.

The Township rate for 1910 will have to be raised and those of the Schools lowered to correct the unwarranted levies of the latter.

Year.	Assessment.	Tp. Rate.	S. S. No. 1.	S. S. No. 2.	Arrears.
	$ c.				$ c.
1904	41,764 00	1¼%	2 %	.....	1,002 25
1905	43,079 00	1½%	2⅛%	3⅛%	1,639 51
1906	42,175 00	1¾%	2 1/16%	2⅜%	2,141 27
1907	45,523 00	1½%	1¾%	2 %	2,188 33
1908	50,488 00	2 %	1¼%	2¼%	3,248 82
1909	54,233 00	2¼%	1⅜%	2½%	4,291 46
1910	57,296 00	Rates	not yet	struck.	

The striking of the Township rate has to take into account all remissions likely to be granted.

By-laws must be framed each year for the purpose of authorizing the levies.

Every Municipality is obliged to make estimates of their probable expenditures for the current year, before passing of the By-law levying the rate. If the amount collected in the year is less than required, the estimate must be reduced to meet it. These estimates have not been attended to, as no information regarding them appears in the Minutes.

Estimates are shown herein, of the liabilities at the present time, which, added to the probable expenses of the Township for the balance of the year, will necessitate a rate of about 2¾ per cent., if one-third of the present arrears are collected. With the exception of No. 2 Blezard, the Schools have to their credit sums, if paid

to them, sufficient to save any but a mere nominal rate for the year. Larger collection of arrears ought, of course, to lessen the Township rate mentioned above.

2. Treasurer's Statement.

The statement of each year should have been printed, but this was attended to for the year 1909, only.

A statement for 1908, prepared for the ex-Treasurer, J. A. Lemieux, up to 29th July, omitted the proceeds of a $300.00 note with the Bank of Montreal, also a payment of salary to him of $92.50. These items were afterwards inserted in the cash book, and changed a credit balance to him of $141.55 into one against him of $65.95, which sum he paid over.

A statement for the balance of 1908, from Treasurer, J. A. Brunet, omitted a receipt of $200.00 from the Government grant, and a corresponding sum paid to Moise Henri. Full renewals of notes with the Trader's Bank were not entered on either side of the cash book, as should have been done.

Abstracts of receipts and payments were not strictly correct and a tabulation of these is attached hereto for the period.

Statements of assets and liabilities were also incomplete; balance sheets at the close of each year accompany this report.

3. Ex-Treasurer and Clerk.

J. A. Lemieux, was appointed by By-law No. 1, on the 30th January, 1904, at a salary of $125.00 per annum, and held office apparently until the 13th June, 1908, being the date of the last Minutes signed by him. He was taken ill with typhoid and went to the hospital in Sudbury on the 28th August, 1908. On his return, the local auditor, Mr. N. Lepage, was appointed to make a settlement of his accounts and this was brought to a conclusion by his payment of a balance in his hands to the new Treasurer of $65.95, some time in December, 1908. The adjustment between the two Treasurers has been gone into and found satisfactory, but the manner in which entries were made to complete the cash book to the settlement point made the verification a most troublesome affair.

Solicitor.

Recommendation was made to Council for the appointment of a Solicitor to guide the Clerk and Treasurer in the discharge of duties and to scrutinize the By-laws.

Letters have been read from firms in Sudbury giving valuable advice on several matters, and the Council would do well to obtain more assistance in this way.

Reference should be had to the Solicitor when any affair is to be conducted out of the regular course of business so that they may be informed upon what the Act requires to be done.

4. By-Law No. 11 Colonization Roads.

Introduced in Council 16th October, 1907, finally passed 13th June, 1908.

The Government was requested for two-thirds of cost estimated at $2,000.00.

The Public Works Department, on 15th May, 1908, advise that $1,000.00 has been granted, and write on 9th June, 1908, for copy of By-law 11, which they acknowledged on 3rd July, 1908. A cheque for $781.50 was sent on 30th September, 1908, by the Department to the Treasurer, being one-half of the expenditure on the roads as shown in Treasurer's statement as $1,563.00.

If more was spent on the roads, an additional statement must be sent to the Department. The preparation of this must be undertaken by the Treasurer, and submitted to the Public Works Department, before they will consider a further grant.

The Department enquire on 13th February, 1909, if the cheque was received and the Clerk answers on 19th February, that a cheque was received.

During the illness of J. A. Lemieux, ex-Treasurer, his wife cashed the cheque, deducted certain sums advanced by the ex-Treasurer and handed cash and vouchers for the full amount to Reeve Dubois and Councillor Lepage.

These proceedings were admitted by the two latter persons and confirmed by the ex-Treasurer for his wife.

The Reeve stated his belief that he paid J. A. Brunet all of the vouchers and cash received from Mrs. Lemieux. The Clerk, however, only charged himself with $746.00. The balance of $35.50 is therefore apparently still due to the Township.

The Clerk claims to have entered all the sums as received, and it appearing that the Reeve did not hand over the whole amount at once, and not being quite certain as to what he did hand over, and, moreover, omitting to give and take receipts or to keep memoranda of the affair, it would seem that he ought to be held accountable for the above difference of $35.50.

5. Arrears.

The growth of Arrears has been already pointed out. Balance against the Collectors, aggregating $2,537.78, represent taxes, either irrecoverable or needing prompt collection.

Of the above sum $1,454.00 is the amount owing according to the last Roll and is presumably collectible. Therefore, the remaining amount of $1,083.78 requires to be disposed of by Council immediately.

Schedules attached hereto give details of the above mentioned sums.

The Collectors do not appear to have made much exertion to enforce payments and the Treasurer has neglected attention to the selling of lands three years in Arrears.

Certified lists of Arrears giving complete information must be handed in each year by the Collector and filed by the Clerk.

Any lists presented were of the crudest kind and the remainder could not be found.

6. Ditches and Watercourses.

The following rules of procedure are prescribed by the Ditches and Watercourses Act, and should serve as a guide to the Council in determining the course to pursue in the settlement of present disputes and when any further work on Ditches is contemplated.

1. Engineer to be appointed by By-law, form "A."
2. By-law to fix his remuneration.
3. By-law to fix remuneration of Clerk.

4. Engineer removable only by By-law.
5. Engineer to take oath, according to section 4, subsection 3.
6. Ditch to cost not over $1,500.00.
7. Initiating owner requiring ditch to serve notice, according to form "C" on all other owners or occupiers affected.
8. Notice to name date, hour and place of meeting.
9. Notice to be served twelve days before the meeting.
10. Owners to sign agreement per form "D."
11. Agreements to be filed within six days, with the Clerk.
12. Reeve to sign agreement with other Municipalities.
13. Agreement to apportion the work to be done by each.
14. If agreement is not signed within five days after meeting the initiating owner makes the requisition, according to form "E."
15. Requisition is made to the Engineer and names lands interested, and requests a meeting.
16. Requisition to be filed with the Clerk.
17. Clerk to register copy of the requisition to the Engineer.
18. Engineer shall write to the Clerk naming place and time of meeting.
19. Time to be from ten to sixteen days from date Engineer receives notice from the Clerk.
20. Clerk shall file Engineer's notice and register copy of same to the initiating owner.
21. Owner shall serve notice four days before the time of meeting to the owners, requiring them to attend.
22. Initiating owner shall endorse one copy of such notice, with the time and manner of serving each notice.
23. Initiating owner to furnish such endorsed copy with the Engineer the day before the meeting.
24. Notice to be served personally, or with an adult.
25. Notice to non-residents with their agents, or addressed to their last post office.
26. Occupants may be served instead of owners.
27. Engineer conducts meeting, makes his award and files it with the Clerk.
28. Clerk notifies those affected of the contents of award.
29. Dissatisfied parties may appeal to the Judge in 15 days.
30. Engineer decides about ditch into the next Township.
31. Municipality is required to keep proper forms for use under the Act.

The above directions would have been sufficient to have enabled Council to avoid irregularities which have occurred in the procedure, with regard to each of the watercourses constructed. Such irregularities do not seem significant enough to exonerate the owners from the payment of levies.

The Engineer has made his awards, drawn maps, apportioned work, and expenses, made declarations and advised the interested parties. Appeals against awards are not in evidence.

The sale of contract for extension No. 1 Drain was ordered by the Reeve on account of weather conditions not permitting time for Council to deal with the matter regularly. The Engineer stated that he personally delivered notices for the sale, and that no objections were made to him. It seems, therefore, reasonable to require those interested to make payments of levies for this drain so as not to burden its expense upon the whole Township.

Neither the Rolls nor the Vouchers for payments on drains afford sufficient information for ascertaining the separate conditions of the five drainage accounts, and it was not considered desirable to prolong the enquiry by any attempt to do so.

The Engineer's awards were the only clean exhibits of what had been undertaken. Minutes contain little or no information upon these matters.

As the result of many interviews with parties affected by drainage levies, it is certain that their unwillingness to make payment arose from the feeling that they had not been properly consulted by Council, rather than that they have not benefited by the work, although some of it was done in a manner far from being satisfactory.

Carriere Ditch.

The complainant in this instance, F. Carriere, being interviewed at his request, stated that the branch drain from concession 2, lot 1 to lot 4, was undertaken in an irregular manner. Meetings were not called to consider it, nor were notices served upon the owners. That he could not perform the work apportioned to him, and therefore it was sold for $50.00, and on his refusing payment a horse was impounded, to recover which he paid $59.00, and commenced suit against the Township, whereupon Reeve refunded $25.00, and is said to have promised him the balance. Whatever right the Council had to enforce payment would depend upon the extent to which the law was complied with in the getting the drain made. Judging from the records, the method pursued was not strictly in accordance with the Act and, therefore, the relinquishment of the claim against Carriere might have been deemed the best course.

This opinion, however, did not give the Reeve the right to get the money from the Treasurer for the purpose, until such refund was sanctioned by Council, nor to commit them to any action at all.

Carriere alleges that the work could have been done for $12.00, and even the Engineer admits that $50.00 was much too high.

The circumstances under which the drain work was sold to George Pharand, although unsatisfactory to Francis Carriere, are strong enough to oblige him to make a reasonable settlement with the Council.

7. Delegation to Ottawa, Etc.

The complaint made by certain petitioners under this head bears upon the payment instructed by Council, furnishing $50.00 expense money in January, 1910, to the Reeve and Mr. E. Danis.

The Congress was for the purpose of discussing the adoption of the dual languages in the Schools, and was the concern of the individual school supporters, rather than that of the Township as such. Many private parties in other parts attended the Congress at their own expense, and it would have been more regular if those in this Township had sent a delegate at their own personal expense, instead of imposing it upon the Township funds.

The rate-payers are almost without exception of French extraction, and accordingly might be said to be wholly interested in the object of the Congress, yet the trip was made for the purpose of helping to bring about change in the school methods, which might have an effect contrary to the wish of future inhabitants.

The Municipal Act does not provide for any such grant and the action of the Council must therefore be considered an illegal one.

Minutes of 12th January, 1907, appoint J. C. Dutrisac, M.D., as Health Officer under the Public Health Act, section 31. His account against the Township was settled by them for $30.00, on resolution of 27th April, 1907, but contrary to the advice of Solicitors that the services were rendered to O. Seguin.

The Council, however, undertook the payment of the bill and its subsequent recovery from the invalid.

The Reeve's explanation is that the doctor's services were necessary for the protection of the Public Health.

The records are so meagre of information that the facts of the occurrence are difficult to arrive at.

That advice from a Solicitor should be sought only to be disregarded does not reflect credit upon the Council of that year.

8. Treasurer and Clerk.

J. A. Brunet, occupied the dual position on resolution of Council, dated 26th September, 1908.

His duties with regard to the Rolls of the Assessors and Collectors have been very much neglected.

Both in the preparation of the By-law and in the record of the proceedings of Council, insufficient information was recorded.

The Cash Book is not of statutory form, nor has it been kept in a careful manner.

A warrant to the Mining News of $10.00 on 19th December, 1908, was entered on that date and again on 20th January, 1910. This sum is charged back to the Treasurer.

A payment to F. Carriere, by the Reeve, of $25.00 on 16th April, 1910, is entered by the Treasurer as if paid by him, and the Reeve is entitled to recover it. This payment has yet to pass Council.

In accounting for his cash on hand, the Treasurer was found to be short $112.20. This situation was reported at once to the Council.

The Imperial Guarantee Co., of Toronto, has bonded the Treasurer for $400.00, and must be notified at once by the Reeve of the Treasurer's deficit, otherwise recovery cannot be made.

The Treasurer should retain no cash in his hands while a loan from the Bank remains unpaid.

9. Minutes.

These are well drawn in certain respects, but a large number of them contain legislation which is the province of By-laws. The features properly attended to are:

1. Number, date and place of meeting.
2. Names of those present.
3. Re-reading of previous Minutes.
4. Movers and seconders of each resolution.
5. Adjournment to stated time.
6. Signatures of Reeve and Clerk.

The essentials neglected in the Minutes are:

1. Correspondence from persons within or without the Municipality should always be read to the meeting by the Clerk and recorded.

2. Reports should be received and recorded with due consideration thereto from

A. Assessor, as to completion of Roll.

B. Collector reciting his settlement with the Treasurer and the date thereof, and exhibiting list of arrears to be brought forward upon the next roll, or else disposed of by sale of the lands being instructed.

C. Pathmasters report, concerning the performance of statute labour and giving names of those doing this work, who are to be charged up in this roll.

D. Fence-viewers report, as to what they have found and the work that they consider should be dealt with.

E. Pound-keepers report of the number and kind of animals found at large in each district, with the owners' names, fines imposed and their share of the same.

F. Engineer's reports from time to time upon the progress of the water-course construction for the various ditches, according to number, this report being added to by that of the Assistant Engineer and Inspectors.

G. Clerk, as to any work which he may have performed since the last Council meeting that was required of him by statute or resolution, including any reports sent to the Government, petitions from ratepayers, births, marriages and deaths, results of enquiries made by any of the Council at the previous meeting, and also as to the need of borrowing money.

H. Health Board report, as to any cases having required their attention during the month and stating what was done in the matter.

I. Treasurer's statement of receipts and payments in detail since the last meeting with balance in his hands, also particulars of any money borrowed, Government grants, etc., also estimates of expenditure for the year.

J. Auditor's report as to the condition of the books and accounts for the previous year and the correctness of the same.

K. Accounts to be paid when such are not sanctioned by By-law or the statutes.

These matters and any others requiring deliberation will as they arise be laid before the Council at each meeting, and it is their business to cause a true and complete record to be made in the Minutes of each matter brought before them, in what manner it was passed upon.

The Council is a deliberative body, who meet for the purpose of getting acquainted with the Acts of its officers and for instructing them in their duties, when special cases arise where single acts can be performed.

When permanent action is to be taken, it becomes necessary to enact legislation for the purpose, and a By-law must in all cases be passed, which will cover such Municipal Acts as:

A. Appointment of all officers.

B. Regulation of their duties.

C. Remuneration of officials.

D. Fees for Councillors and Reeve.

E. Removal of any officer within the year.

F. Construction of roads and watercourses.

G. Granting of contracts.

H. Adoption of Engineer's award.

I. Fixing of Assessor's basis of valuation.

J. Fixing of rates for Township purposes, School purposes and Watercourse levies, and showing the assessed value in each case, subject to the rate.

K. Borrowing money for any purpose, stating reasons, the amount, the rate of interest, from whom obtained and for what time.

L. Sale of work not done under awards.

Minute Book, pages 81 and 82 appear to have been cut out, during the time that J. A. Lemieux held office. The ex-Treasurer stated that he had no knowledge of the contents of these leaves, nor could he recollect the reason for excision. This act was most irregular and must not be repeated. Any miswritten pages can be ruled across as cancelled.

Accounts were not all properly passed in Council and must be fully set out therein in future.

Some of the payments made were not true to the amount passed by Council and this irregularity must also be guarded against hereafter.

With a few exceptions, the minutes were all properly signed and dates complete. The writing in some instances was scarcely legible. In getting at the proceedings of the Council, as these were all written out in French, considerable time was occupied in translating, and a synopsis has been prepared so that the history of the doings of the Council in brief may be on record. An index to these minutes has also been prepared in order that reference may be had to the page of the minute book in which certain matters were attended to.

10. Accounts.

The position of the Township had to be arrived at with regard to the two school sections, the three Union school sections, the five watercourses, the debentures, the Traders Bank, the Bank of Montreal, the two Collectors, two Treasurers, and the various Municipal expenses and incomes.

It became, therefore, necessary to post up a ledger for the whole period, from 1st January, 1904, to 27th April, 1910, and also to write up a Journal for the same time.

These books are now complete, and should be continued in the same form by the Treasurer.

Statements for each year drawn from the Ledger accompany this report and may be annually prepared in the same manner hereafter.

Each of the accounts with the schools must be credited with the levies made and charged with the payments to School Treasurers.

The watercourse accounts have to be separated and charged with any payments for construction and credited with the levies made on those for whom the work was done.

An account has to be kept with each loan made until it is disposed of.

The Collector will each year be charged with the amount of his roll and receive credit for the sums he pays over to the Treasurer and also for his percentage, and the arrears when sworn to.

Accounts are needed for each class of expenses, *i.e.*, Roads and Bridges, Salaries, Board of Health, Printing and Stationery, Grants, Interest, etc.

Income ought to be separated into License Fees, Provincial Grants, Arrears of Taxes, Statute Labour and Township Rate.

11. Collector's Roll.

The method of handling this important book is significant for the laxity of its preparation.

The features that have not been observed are as follows:

1. The Clerk's certificate, which must be attached when the roll is complete, has been absent in each case.

2. The date of delivery to the Collector not being fixed by Council By-law, should not have been later than the first of October.

3. The Collector upon receiving the Roll, instead of proceeding at once to collect, appears to have been considerably delayed in this work.

4. The return of the roll was systematically postponed by the Council, and extended beyond the legal date, even into the following fall, and thus the tax collections of one year overlap those of another.

5. The oath of the Collector which is required when the roll is returned is not in evidence in any year.

6. The summary for the Collector and settlement with the Treasurer is entirely lacking in every year.

7. List of arrears in 1904 could not be found, although entries were made on next year's roll purporting to be such arrears brought forward with 10 per cent. added.

8. The whole of the roll for 1909 was in arrears at the 31st December, in that year.

9. It is possible to raise by debentures a loan on the credit of arrears. This would make the moneys thus locked up available.

10. Settlement of 1904 Roll shows a balance against Nap. Menard, Collector, of $101.29, but the particular items unreturned are not easily distinguishable; the Treasurer apparently gave receipts to the Collector, which he lost; the alterations in Roll may have been sanctioned by Council, and the subsequent two years were correctly dealt with, so that the Collector may be given some consideration in that matter.

11. Carelessness in preparation of Rolls is very prevalent, especially in 1908 and 1909—misuse of columns and wrong additions being noticeable.

12. School levies for debentures were mixed in with those on requisition.

13. The Roll had to be re-added for the whole of the six years.

14. Watercourse levies were entered in a confused and arbitrary manner.

15. Settlement of 1905 made by Nap. Menard is in balance.

16. Settlement of 1906, made by Louis Menard for L. Menard, is only $1.22 out.

17. Settlement of 1907 and 1908 exhibit balances against Louis Menard of $151.27 and $832.44 respectively.

18. The date of the final return of the roll is fixed as 1st February by the Act.

12. Assessor.

Reported to have taken oath of office, but no record thereof is available.

The Rolls from 1904 to 1910 were gone over and every item checked separately into the Collector's Rolls. Errors of transference are shown upon summaries of the latter Rolls. Not in any year has there been any affidavit of the Assessor attached to the Rolls, as required by the Act.

Columns for values of lands and buildings have not been added, nor has any final summary of the Assessment Roll been made in any year.

Revisions of these Rolls were, according to the Clerk's statement, made by altering the figures of the Assessor, and there is no record in the proceedings of the Revision Court as to what amendments were made, although they should

have been carefully set out in detail therein, with the reasons. Changes must have the initial of the Clerk placed against them. Dates of final revision are shown in the minutes of the Court of Revision which sat in each year.

Final revision of the Rolls was made on dates as follows and certified to:

18th June, 1904; 10th June, 1905; 1906, unnoted; 1907, unnoted; 13th June, 1908; 5th June, 1909.

No map of the Township is available, therefore any guide as to the proper preparation of the Assessor's Roll is out of the question.

The oaths required of the members of the Court of Revision are not on record, and their proceedings are bare of any detail, so that alterations of the Roll were not recorded in a proper manner. These should have been supported by formal complaints placed on record.

Reports from each Pathmaster made from 1904 to 1907 were in good form, but not very clear as to the statute labor to be charged up on the roll for work not done by the rate-payer. It appears that the Council have paid to those who did the work in those cases where the assessed party neglected it at a higher rate than was allowed to those who did their own work as statute labor. The Act, however, fixes the limit of imposition at $1.00 a day against those who neglect work.

Resolutions have been passed reducing the statute labor required in certain sections only. This is not permissible, but must apply to the whole of the Township. The rate of commutation must not exceed $1.00 a day, even though a higher sum must be paid to get the work done. This is offset, however, by limiting the amount to be spent upon the road, where the taxes were commuted to the amount collected.

13. By-Laws.

As mentioned under the heading of Minutes, these have been quite insufficient in number, and should have been added to where resolutions have taken their place, with regard to the actions of the Council under the heading referred to. Those passed were as follows in the abstract:

1. 30th January, 1904, appoints as Secretary-Treasurer, J. A. Lemieux, at $125.00 per annum, no bond mentioned.

This should have been succeeded by another, one about the time of Lemieux's illness, cancelling his arrangement, since J. A. Brunet was appointed by resolution of Council.

2. 27th February, 1904, appoints as Assessor, Napoleon Menard, at $25.00 for the assessment of the year.

3. 27th February, 1904, appoints the same man as Collector, giving him 5 per cent. of all collections, and demanding security of $200.00.

This should have been followed by some mention of such security and of its acceptance by Council.

4. 27th February, 1904, makes a road allowance 1 concession Hanmer, and 6 concession Blezard.

5. 1st May, 1904, establishes a pound and enumerates the fees of pound-keepers.

This copy is unsealed.

6. 30th January, 1905, appoints Secretary-Treasurer, J. A. Lemieux, at $125.00.

No bond is mentioned and a copy is unsigned and unsealed.

7. 30th January, 1905, appoints as Assessor, Napoleon Menard, at $25.00 for the assessment of the year.

This copy is also unsigned and unsealed.

8. 30th January, 1905, appoints as Collector, Napoleon Menard, at 5 per cent. of collections and with security at $200.00.

Sureties not reported on, and copy unsigned and unsealed.

9. 10th June, 1905, appoints as Engineers, Demorest & Stull.

This firm is said to have been too busy to act. Another By-law should have been passed appointing substitutes.

10. 27th June, 1905, authorizes debentures of $600.00 for School Section No. 2; term six years, with annual payment of principal and interest of $122.02 from 1906 to 1911, and payable at the Ontario Bank, Toronto.

With regard to this, it is reported by the Toronto General Trusts Corporation, holders of same at this date, that they have received payment of all debentures except the last one due the 7th January, 1911, for $122.02.

Some of these debentures were paid by the Township and some by the School. This course was very irregular, as the Township should have made all payments, being directly liable.

Debenture money proceeds should have been paid into the Township account and checked out of that to the School Treasurer, instead of going direct to him.

11. 16th October, 1907, finally passed 13th January, 1908, proposed road improvements, concessions 2, 3 and 4, amounting to $2,000.00, and claims from the Government 2/3, $1,366.66 (which should have been $1,333.33), and leaving the Township to pay the balance.

It appears that the Government paid only $781.50, as they received a report from the Clerk of the expenditure at less than was contemplated.

The condition of the books does not allow of an amended report of the work done, being made up within a reasonable time. The Clerk should send this to the Government, who may be requested for a further payment.

12. 26th September, 1908, makes a loan with no amount stated, on note with interest at 8 per cent. from the Traders Bank.

This is an irregular enactment and the copy is unsealed.

13. 24th April, 1909, closes the La Portage Road.

TOWNSHIP OF HANMER.

ESTIMATES, 27TH APRIL, 1910, FROM WHICH TO STRIKE THE RATE FOR 1910.

Available Income Probable:			
Statute Labour for 1910	Est.		$100 00
Licenses for 1910	Est.		50 00
Tax Arrears Interest for 1910	Est.		50 00
Cash in Treasurer's Hands this date			432 20
Arrears from 1909 Collectible	Est.		500 00
Probable Expenses Payable:			
Interest on Loans	Est.	$75 00	
Expenditures on Roads	Est.	400 00	
Stationery and Printing	Est.	25 00	
Salaries of Officers and Council	Est.	350 00	
Sundry Expenses	Est.	50 00	
Liabilities to be Paid Off:			
Traders Bank Note		$721 00	
S. S. No. 1, Hanmer		505 52	
S. S. No. 2, Hanmer		329 93	
U. S. S. No. 1, Blezard		6 52	
U. S. S. No 1, Capreol		33 16	
U. S. S. No. 2, Capreol		137 01	
Township Rate on 1910 Assessment			1,500 94
(May be placed at 2¾ per cent. on $57,296.00.)			
		$2,633 14	$2,633 14

Characters of the By-laws make it evident that Solicitor's advice is needed in the preparation, registration, publication and the execution of these and the Council would do well to submit them when drafted for the sanction of the Solicitor they appoint.

15. Bonds.

Bonds refer to Collector Napoleon Menard and are for 1904 and 1905.

There is at present a bond on the Secretary-Treasurer, J. A. Brunet, now in office, issued by the Imperial Guarantee Co., No. 02656 for $400.00 for year of 1910 only, and a receipt seen for premium of $5.00.

There does not appear to be any bond on Louis Menard, Collector, and this must be obtained by Council at once.

16. Auditors.

The following directions should have been followed by Council, with regard to these officers.

1. There should have been two appointed for each year and by By-law.
2. They should take oaths concerning their duties.
3. They should make a report on the accounts and such report should be printed.
4. The Council's duty is to receive the report and finally pass it.
5. Auditors may not be appointed by any Council to audit the accounts of that year. Their duties have reference to the accounts of the calendar year preceding, or under certain circumstances to the accounts of the succeeding year.
6. They should check the Rolls to see that they correspond and certify to the Collector's summary and return.

17. Loans.

These have been authorized by resolution, instead of by By-law. The amount to be raised is often indefinite, as well as the purpose for which it was required.

Temporary loans may not be made except to anticipate the taxes, and for ordinary expenditure, or for school purposes, not exceeding the estimates.

Debentures for $500.00 were sold by the School No. 2, direct in 1903, and were apparently provided for in requisitions since.

The transactions on notes were very confused and need careful record in future.

18. Schools.

The Statutory Cash Books have been kept by the Treasurer for No. 1 and No. 2 Hanmer in a satisfactory manner.

As no statements were in evidence for the various years, there has been attached hereto one in condensed form for the whole period.

The bond of J. Bellard, Treasurer, is not in good form and the trustees are desired to have it made complete.

The insurance policies will also need to be carefully looked after, in order that the property may be fully protected.

Requisitions upon the Township for funds must show the amount required after deducting Government grants, rent or any extraneous income.

The rate for 1910 will require to be very low, as the Township is bound to pay the schools the amounts to their credit and such sums ought to be sufficient to cover school expenses for the balance of this year.

The debt at this date to No. 1 Hanmer is $505.52, and to No. 2 Hanmer $329.93, after payment of debenture.

Requisitions must be complete in every respect and signed by two trustees and a copy kept.

Receipts must be given to Township Treasurer of all sums as received.

Statements are to be prepared every year and duly audited.

Municipal Returns.

These were made as required by the Government as follows, according to copies in the hands of the Clerk: Assessment Roll to the Bureau of Industry, 1904, 1905, 1906, 1907, and 1908. Debenture Debt to the Minister of Agriculture for 1904, 1905, 1906, and 1907. Collection Roll to the Bureau of Industry, 1904, 1905, 1906 and 1907. Cash Statement to the Bureau of Industry for 1904, 1905, 1906 and 1907.

Adoption of Report.

In view of the unsatisfactory condition of the Treasurer's cash, the settlement of Collector's Rolls for 1907, 1908 and 1909, the presence of large arrears, also the necessity for continuing the account with the Schools, the Loans, the Watercourses and the Collectors, it was recommended to Council that a By-law be passed appointing a local auditor to see that the recommendations made in this report are fully carried out, and that he shall attend in particular to the matters following:

1. The immediate production by the Treasurer of his shortage.
2. Or the possession of the bond of the Treasurer and the notification of the Guarantee Co.
3. The settlement of the Roll of 1904, with Nap. Menard.
4. The settlement of the Rolls of 1907, 1908, 1909, with Louis Menard.
5. The enforcement of the Collection of Arrears by the Collector or by the Treasurer.
6. The proper keeping of the Township Ledger. Mr. Napoleon Lepage, having been chosen by the Council as the official for the above purposes, it is necessary that he shall be handed the attached report with instructions to account to Council at each meeting for the progress made in his duties.

Schedules.

Statements attached hereto and forming part of this report cover the six years of 1904, to 1909, and to 27th April, 1910, as hereunder enumerated.

1. Treasurer's Cash Accounts tabulated.
2. Balance Sheets and Township Funds.
3. Collector's Summaries.
4. Collector's Settlements.
5. Arrears of Taxes.
6. School Cash Accounts tabulated.
7. Epitome of Minutes and index thereto.
8. Councillors and officers.

The difficulties of the enquiry were considerably added to by the necessity of translating records, of interpreting the evidence furnished by the Reeve and others and by the bad roads and long distances which had to be covered by those requiring to attend.

All of which is duly submitted.

Yours faithfully,
Oscar Hudson,
Chartered Accountant.

TOWNSHIP OF HANMER.

Tabulation of Receipts from 1903 to 1909 Inclusive.

S. S. No. 1, Hanmer.

——	1903.	1904.	1905.	1906.	1907.	1908.	1909.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Balance at First of Periods	.....	125 20	158 16	84 36	121 90	39 19	155 07
Rent	.....	.....	22 00	5 00	12 00	9 00	4 00
Debentures	500 00	.....	.....	.....	.....	.....	.....
Grants	74 50	49 75	149 75	100 00	77 00	240 00	137 40
Loans	.....	168 65	144 85	.....	.....	.....	.....
Taxes	228 67	500 21	382 88	274 59	407 96	182 38	200 00
	803 17	843 81	857 64	463 75	618 86	470 57	496 47

Tabulation of Expenses from 1903 to 1909 Inclusive.

S. S. No. 1, Hanmer.

——	1903.	1904.	1905.	1906.	1907.	1908.	1909.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Building, etc.	378 92	2 90	.....	.....	13 32	.....	3 20
Teachers	189 80	342 75	275 00	165 00	335 00	245 75	332 10
Fuel	14 50	15 75	10 00	16 95	12 50	16 25	15 00
Repairs	19 50	31 25	27 00	14 40	15 50	15 00	30 50
Interest	11 00	38 00	45 78	7 00	4 00	.....	.....
Sundries	14 75	.....	1 50	.....	30 35	.....	8 30
Salaries	49 50	40 00	12 50	41 50	69 00	38 50	23 50
Debentures	.....	150 00	250 00	.....	100 00	.....	.....
Loans	.....	65 00	151 50	97 00	.....	.....	.....
Balance at Last of Periods	125 20	158 16	84 36	121 90	39 19	155 07	83 87
	803 17	843 81	857 64	463 75	618 86	470 57	496 47

Tabulation of Receipts from 1905 to 1909 Inclusive.

S. S. No. 2, Hanmer.

——	1905.	1906.	1907.	1908.	1909.
	$ c.	$ c.	$ c.	$ c.	$ c.
Balance at First of Periods	.....	181 92	35 46	9 90	99 27
Rent	17 75	.....	.....	.....	.....
Debentures	600 00	.....	.....	.....	.....
Grants	50 00	100 00	69 00	230 00	95 00
Taxes	.....	360 69	549 50	50 44	322 02
	667 75	642 61	653 96	290 34	516 29

TABULATION OF EXPENSES FROM 1905 TO 1909 INCLUSIVE.

S. S. No. 2, Hanmer.

——	1905.	1906.	1907.	1908.	1909.
	$ c.	$ c.	$ c.	$ c.	$ c.
Building, etc.	477 20	128 88	12 32	.....	13 95
Teachers	.....	279 00	280 00	133 76	250 00
Fuel	1 50	30 75	.....	.....	14 75
Repairs	.....	21 00	8 50	3 00	2 25
Interest	.....	22 52	44 54	.....	22 02
Sundries	7 13	.....	35 20	5 30	13 22
Salaries	.....	25 00	63 50	49 01	35 00
Debentures	.....	100 00	200 00	.....	100 00
Balance at Last of Periods	181 92	35 46	9 90	99 27	65 10
	667 75	642 61	653 96	290 34	516 29

TABULATION OF RECEIPTS FROM 1ST JANUARY, 1904, TO 27TH APRIL, 1910.

——	1904	1905	1906	1907	1908	1909	1910
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Balance first of periods	.....	34 41	42 91	319 41	113 98	233 43	2 04
Tax collections	370 44	1,096 56	2,121 84	2,212 30	1,693 52	1,730 39	1,753 68
Licenses	.....	2 08	53 75	.....	105 90	24 00	24 80
Fines and fees	.....	.....	65 00	46 50	.....	.....	.....
Traders Bank Loans	250 00	900 00	.....	.....	375 00	929 70	.....
Montreal Bank Loans	.....	.....	.....	550 00	1,500 00	.....	.....
Sigouin Alex. Loans	.....	.....	200 00	.....	.....	.....	.....
Government Grant	.....	.....	.....	.....	710 00	36 00	.....
Roads and Bridges	.....	.....	.....	44 75	19 65	.....	.....
Refunds	.....	.....	.....	.....	.....	.....	20 70
	620 44	2,033 05	2,483 50	3,172 96	4,518 05	2,953 52	1,801 22

TABULATION OF EXPENDITURES FROM 1ST JANUARY, 1904, TO 27TH APRIL, 1910.

——	1904	1905	1906	1907	1908	1909	27 April 1910
	$ c.	$ c.	$ c.	$ c.	c c.	$ c.	$ c.
S. S. No. 1 Hanmer	220 00	382 88	274 39	407 96	182 38	200 00	175 00
S. S. N. 2 Hanmer.	.....	.....	360 69	549 50	50 44	322 70	269 62
U. S. S. No. 2 Blezard	.....	171 60	43 80	35 82	21 21	22 00	.....
U. S. S. No. 1 Capreol	20 00	8 50	150 00	442 43	310 79	199 30	27 72
U. S. S. No. 2 Capreol	.....	83 82	292 44	287 43	288 51	250 41	.....
Traders Bank Loans	125 00	675 00	350 00	.....	.....	400 00	300 00
Montreal Bank Loans	.....	.....	.....	.....	1,350 00	700 00	.....
Sigouin Alex. Loans	.....	.....	.....	200 00	.....	.....	.....
Interest	2 50	17 87	7 00	37 37	38 25	44 05	18 11
Roads and bridges	79 65	150 78	164 56	421 15	1,258 01	112 27	27 75
Stationery and printing	56 88	21 68	15 25	9 49	9 88	46 15	37 62
Salaries	82 00	438 19	311 45	458 67	463 81	261 66	116 00
Watercourses	.....	.....	58 82	34 56	203 34	65 00	100 85
Road Machine	.....	.....	.....	63 00	63 00	62 00	62 00
Board of Health	.....	.....	.....	30 00	.....	246 00	5 00
Registration	.....	.....	19 80	11 60	.....	.....	.....
Town lot	.....	.....	50 00	.....	.....	.....	.....
General	.....	39 82	65 89	70 00	45 00	19 94	229 35
Balance last of periods	34 41	42 91	319 41	113 98	233 43	2 04	432 20
	620 44	2,033 05	2,483 50	3,172 96	4,518 05	2,953 52	1,801 22

Balance Sheet as per 27th April, 1910.

Assets.

Cash in hands of Treasurer		$432 20
Taxes Uncollected, Louis Menard, 1906-1909		2,436 49
Taxes Uncollected, Nap. Menard, 1904		101 29
Town Property		50 00
Road Machine		250 00
S. S. No. 2, Hanmer	Debenture	122 02
Ditches and Watercourses	Short levied	39 77
Government Grant	Balance of $781.50	35 50

Liabilities.

Traders Bank	On Note	$721 00
S. S. No. 1 Hanmer	Not paid over	505 52
S. S. No. 2 Hanmer	Not paid over	329 93
U. S. S. No. 2, Blezard	Not paid over	6 52
U. S. S. No. 1, Capreol	Not paid over	33 16
U. S. S. No. 2, Capreol	Not paid over	137 01
Debenture No. 6	Due 7th Jan., 1911	122 02
Surplus available for Township purposes, but subject to reduction by uncollectible Taxes that may be ordered written off by Council from the rolls of 1904, 1907, 1908 and 1909		1,612 11
		$3,467 27 $3,467 27

Township Fund, 1st Jan. to 27th April, 1910.

Balance, 1st Jan., 1910		$1,896 29
Licenses		24 80
Interest	$56 96	
Roads and Bridges	27 75	
Stationery and Printing	27 62	
Salaries	21 30	
General Expense	175 35	
Surplus, 27th April, 1910	1,612 11	
	$1,921 09	$1,921 09

Balance Sheet as at 31st December, 1909.

Assets.

Cash in hands of Treasurer		$2 04
Taxes Uncollected, Louis Menard, 1909		4,190 17
Taxes Uncollected, Nap. Menard, 1904		101 29
Town Lot		50 00
Road Machine		250 00
Government Grant	Cash unaccounted for	35 50
Watercourses	Short levied	12 77
S. S. No. 2, Hanmer	Debentures Nos. 5 and 6	244 04

Liabilities.

Traders Bank	Loans	$982 15
Debentures	School No. 2	244 04
S. S. No. 1, Hanmer		680 52
S. S. No. 2, Hanmer		599 55
U. S. S., No. 1, Blezard		6 52
U. S. S., No. 1, Capreol		60 88
U. S. S. No. 2, Capreol		137 01
Good Roads Machine Co., Ltd.		62 00
Unpaid Warrants	List	216 85
Surplus	Township Fund	1,896 29
		$4,885 81 $4,885 81

Township Fund for the Year 1909.

Income:		
General Levy, 1909—$54.233.00 at 2¼ per cent.		$1,220 99
Statute Labour Levy		126 00
Tax Arrears, 1908, Interest		39 08
Licenses		24 00
Expenses:		
Interest on Notes	$121 50	
Roads and Bridges	112 27	
Stationery and Printing	46 15	
Salaries	345 66	
General	23 94	
Delegation to Ottawa	50 00	
Board of Health	90 00	
Surplus, 1st Jan., 1909		1,275 74
Surplus, 31st Dec., 1909	1,896 29	
	$2,685 81	$2,685 81

Balance Sheet as at 31st December, 1908.

Assets.

Cash in hands of Treasurer		$233 43
Taxes Uncollected, Louis Menard, 1908		3,147 53
Taxes Uncollected, Nap. Menard, 1904		101 29
Town Lot		50 00
Road Machine		250 00
Government Grant.....Cash unaccounted for		71 50
Watercourses .....Short levied		37 34

Liabilities.

Bank of Montreal	$700 00	
Traders Bank	375 00	
S. S. No. 1, Hanmer	413 55	
S. S. No. 2, Hanmer	426 78	
U. S. S. No. 2, Blezard	5 13	
U. S. S. No. 1, Capreol	217 46	
U. S. S. No. 2, Capreol	353 43	
Good Roads Machine Co., Ltd.	124 00	
Surplus .....Township Fund	1,275 74	
	$3,891 09	$3,891 09

Township Fund for the Year 1908.

Income:		
General Levy, 1908, $50,488.00 at 2 per cent.		$1,010 92
Statute Labour Levy		72 00
Tax Arrears, 1907, Interest		57 14
Licenses		105 90
Expenses:		
Interest on Notes	$38 25	
Roads and Bridges	456 86	
Stationery and Printing	9 88	
Salaries	329 77	
General	45 00	
Surplus, 1st Jan., 1908		909 54
Surplus, 31st Dec., 1908	1,275 74	
	$2,155 50	$2,155 50

BALANCE SHEET AS AT 31ST DECEMBER, 1907.

Assets.

Cash in hands of Treasurer		$113 98
Taxes Uncollected, Louis Menard, 1907		2,087 04
Taxes Uncollected, Nap. Menard, 1904		101 29
Town Lot		50 00
Road Machine		250 00
Watercourses		26 45

Liabilities.

Bank of Montreal ..... Loans	$550 00	
S. S. No. 1, Hanmer	262 31	
S. S. No. 2, Hanmer	135 34	
U. S. S. No. 2, Blezard	3 13	
U. S. S. No. 1, Capreol	274 97	
U. S. S. No. 2, Capreol	259 60	
Good Roads Machine Co., Ltd.	187 00	
Salaries Unpaid	46 87	
LePage, E. ..... Councillor $16 50		
Menard, L. ..... Collector 30 37		
$46 87		
Surplus ..... Township Fund	909 54	
	$2,628 76	$2,628 76

TOWNSHIP FUND FOR THE YEAR 1907.

Income:		
General Levy, 1907, $45,523.00 at 1½ per cent.		$682 57
Statute Labour Levy		115 00
Tax Arrears, 1906, Interest		54 65
Fines and Fees		46 50
Expenses:		
Interest on Notes	$37 37	
Roads and Bridges	376 40	
Stationery and Printing	9 49	
Salaries	360 55	
General	70 00	
Registration	11 60	
Board of Health	30 00	
Surplus, Ist. Jan., 1907		906 23
Surplus, 31st Dec., 1907	909 54	
	$1,804 95	$1,804 95

BALANCE SHEET AS AT 31ST DECEMBER, 1906.

Assets.

Cash in hands of Treasurer		$319 41
Taxes uncollected, Louis Menard, 1906		2,039 98
Taxes Uncollected, Nap. Menard, 1904		101 29
Town Lot		50 00
Road Machine		250 00
Ditches and Watercourses		58 82

Liabilities.

Sigouin, Alexandre ..... Loan	$200 00
Good Roads Machine Co., Ltd.	250 00
S. S. No. 1, Hanmer	370 60
S. S. No. 2, Hanmer	391 70
U. S. S. No. 2, Blezard	17 62

U. S. S. No. 1, Capreol		408 05	
U. S. S. No. 2, Capreol		187 10	
Salaries Unpaid		88 20	
Dubois, O	Reeve $26 00		
Sigouin, A.	Councillor 15 00		
St. Jean, J. B.	Councillor 15 00		
Menard, L.	Collector 32 20		
	$88 20		
Surplus	Township Fund	906 23	
		$2,819 50	$2,819 50

Township Fund for the Year 1906.

Income:		
General Levy, 1906, $42,175.00 at 1¾ per cent.		$738 18
Statute Labour Levy		105 00
Tax arrears, 1905, Interest		26 04
Licenses		53 75
Fines and Fees		65 00
Expenses:		
Interest on Notes	$7 00	
Roads and Bridges	164 56	
Stationery and Printing	15 25	
Salaries	312 55	
General	65 89	
Registration	19 80	
Surplus, 1st Jan., 1906		503 31
Surplus, 31st Dec., 1906	906 23	
	$1,491 28	$1,491 28

Balance Sheet as at 31st December, 1905.

Assets.

Cash in hands of Treasurer		$42 91
Taxes Uncollected		1,639 51

Liabilities.

Traders Bank	Note	$350 00	
S. S. No. 1, Hanmer		267 13	
S. S. No. 2, Hanmer		410 54	
U. S. S. No. 2, Blezard		23 85	
U. S. S. No. 2, Capreol		109 09	
Salary Unpaid	Collector	18 50	
Surplus	Township Fund	503 31	
		$1,682 42	$1,682 42

Township Fund for the Year 1905.

Income:		
General Levy, 1905, $43,079.00 at 1½ per cent.		$647 43
Statute Labour Levy, 1905		86 90
Tax Arrears, 1904, Interest		17 56
Licenses		2 08
Expenses:		
Interest on Notes	17 87	
Roads and Bridges	150 78	
Stationery and Printing	21 68	
Salaries	293 17	
General	38 92	
Surplus, 1st Jan, 1905		271 76
Surplus, 31st Dec., 1905	503 31	
	$1,025 73	$1,025 73

BALANCE SHEET AS AT 31ST DECEMBER, 1904.

Assets.

Cash in hands of Treasurer		$34 41
Taxes Uncollected		1,002 25

Liabilities.

Traders Bank	Note	$125 00	
S. S. No. 1, Hanmer		230 40	
U. S. S. No. 2, Blezard		149 36	
U. S. S. No. 1, Capreol		8 40	
U. S. S. No. 2, Capreol		88 23	
Salaries Unpaid		163 52	
Lemieux, J. A.	Treasurer $125 00		
Dubois, O.	Reeve 20 00		
Menard, N.	Collector 18 52		
	$163 52		
Surplus	Township Fund	271 76	
		$1,036 66	$1,036 66

TOWNSHIP FUND FOR THE YEAR 1904.

Income:		
General Levy, 1904, $41,764.00 at 1¼ per cent		$522 43
Statute Labour Levy, 1904		54 50
Tax Arrears, 1903, Interest		79 38
Expenses:		
Interest	$2 50	
Roads and Bridges	79 65	
Stationery and Printing	56 88	
Salaries	245 52	
Surplus for General Purposes	271 76	
	$656 31	$656 31

LOUIS MENARD, COLLECTOR, IN ACCOUNT WITH THE TOWNSHIP, 26TH APRIL, 1910.

To Balance of Rolls, as per Accompanying Statements of the following years:

1907	$151 27	
1908	832 44	
1909	1,454 00	
By Apparent Overpayment on Roll 1906		$1 22
Balance against Collector as shown by the Rolls		2,436 49
	$2,437 71	$2,437 71

This Balance may be accounted for to the satisfaction of Council by the Collector preparing lists of the Taxes, as shown for the above years in the Rolls, and that were intended to be written off by Council, and by getting their sanction thereto, also their approval of the list of 1909 arrears.

Attached Lists will assist him in the preparation of his own. Such errors as were made by the Clerk in his preparation of the Roll, the Collector cannot be held accountable for. All such errors of omission or in extensions and additions are duly marked in the Rolls for the guidance of the Collector.

Alterations of the Rolls have very much confused the figures. The difference between the amount of the list of Remissions, when sanctioned by Council, and the above balance against the Collector will have to be cleared up by the collection of escaped Taxes, and if necessary by further payments from the Collector, also by credit for any percentage not paid to him.

SETTLEMENT OF LOUIS MENARD, COLLECTOR OF TAXES, 1909, MADE 27TH APRIL, 1910.

To Amount of Roll, 1909, per Summary	$3,207 68	
By Cash Paid Treasurer in 1910, per Receipts		$1,588 84
By Cash Paid to Treasurer at this Date		164 84
By Arrears drawn from Roll at his request and being composed of items not marked as paid, as per attached list not yet sworn to by the Collector as correct		1,454 00
	$3,207 68	$3,207 68

Upon Final Return of this Roll the Collector must make oath before the Treasurer, according to Sec. 15 of the Assessment Act, so that he may receive credit for Arrears.

COLLECTOR'S SUMMARY OF ROLL FOR 1909.

——	Assessment.	Rate.	Levies.
Township Fund	54,233 00	2¼%	1,220 99
Schools:			
Hanmer S. S. No. 1	26,700 00	1¾%	466 97
Hanmer S. S. No. 2	16,300 00	2¼%	367 27
Blezard U. S. S. No. 2	.....	.....	23 39
Capreol U. S. S. No. 1	.....	.....	42 72
Capreol U. S. S. No. 2	.....	.....	33 99
Hanmer S. S. No. 2—Deb. No. 4	.....	.....	128 20
Statute Labor	.....	.....	126 00
Tax Arrears, 1908	.....	.....	473 73
Watercourses	.....	.....	163 42
Epidemics	.....	.....	161 00
Total Levies	.....	.....	3,207 68

SETTLEMENT OF LOUIS MENARD, COLLECTOR FOR 1908.

To Amount of Roll, per Summary (including arrears from 1908)	$3,326 23	
By Cash Paid Treasurer in 1908, per Ledger		$328 75
Cash Paid Treasurer in 1908, per Ledger		1,730 39
Arrears carried into Roll of 1909, per List		434 65
Balance against him, as below		832 44
	$3,326 23	$3,326 23

COLLECTOR'S SUMMARY OF ROLL FOR THE YEAR 1908.

——	Assessment.	Rates.	Levies.
General Town Purposes	50,488 00	2 %	1,010 92
Schools:			
Hanmer S. S. No. 1	26,690 00	1¼%	333 62
Hanmer S. S. No. 2	15,195 00	2¼%	341 88
Blezard U. S. S. No 2	4,642 00	1½%	23 21
Capreol U, S. S. No. 1	19,540 00	1½%	293 10
Capreol U. S. S. No. 2	15,625 00	2¾%	429 69
Statute Labor Commuted $1.00 day	.....	.....	72 00
Tax Arrears, 1907	.....	.....	629 36
Watercourse No. 2	.....	.....	32 28
Watercourse No. 3	.....	.....	9 17
Sales of Awards:			
Carriere, Landre—Con. 1	.....	.....	50 00
Lemieux, J. A.—Con. 1	.....	.....	36 00
Tyne Bros—Con. 1	.....	.....	35 00
Ouelette, Sam—Con. 2	.....	.....	30 00
Total Levies	.....	.....	3,326 23

ATTEMPTED EXPLANATION OF BALANCE AGAINST L. MENARD, COLLECTOR FOR 1908.

26.	Vivian, A. ..... Short extended	$1 28		
	Lemieux, C. ..... Not carried forward into 1909			$2 00
27.	Lemieux, J. A. ..... " " " " 1909			36 00
28.	Deault, J. B. ..... " " " " 1909			6 80
29.	Dubois, O. ..... Short extended	5 77		
	Culette, S. ..... Not carried forward into 1909			39 16
32.	Chenier, H. ..... " " " " 1909			15 31
33	Clarroys, J. M. ..... " " " " 1909			5 20
	Belanger, J. ..... " " " " 1909			181 92
	Belanger, J. ..... " " " " 1909			20 80
	Belanger, J. ..... " " " " 1909			165 16
	Belanger, J. ..... " " " " 1909			20 80
34.	Lefrancois, I. ..... " " " " 1909			7 29
	Labarge, J. ..... Amount altered	16 00		
	Leblanc, O. ..... " "	5 42		
	Fournier, D. ..... " "	9 00		
	Miller, J. B. ..... " "	18 75		
	Tremblay, L. ..... Not carried forward into 1909			1 21
	Odith, L. ..... " " " " 1909			38 87
35.	Martin, R. ..... " " " " 1909			7 80
36.	Begras, N. ..... " " " " 1909			2 40
	Campeau, O. ..... " " " " 1909			7 68
	Lebeve, J. M. ..... " " " " 1909			1 20
	Begras, A. ..... " " " " 1909			1 20
	Landry, N. ..... Short extended	04		
37.	St. Germin, V. ..... Not carried forward into 1909			14 63
	Martel, J. B. ..... " " " " 1909			3 13
	Martel, J. B. ..... " " " " 1909			2 40
	Boyer, O. ..... " " " " 1909			4 80
38.	La Vallee, L. ..... " " " " 1909			4 80
39.	Mariner, J. ..... " " " " 1909			12 37
	Cheiloux, T. ..... " " " " 1909			7 98
	Legault, F. ..... " " " " 1909			13 83
	Guenette, J. ..... " " " " 1909			14 23
40.	Bigras, A. ..... " " " " 1909			3 45
41.	Guenette, F. ..... " " " " 1909			6 30
	Lamin, A. ..... " " " " 1909			6 78
	Labelle, M. C. ..... " " " " 1909			6 30
	Chaput, E. ..... " " " " 1909			6 30
	Labelle, A. ..... " " " " 1909			6 30
	Amount of taxes apparently open			$674 39
	Amount of errors and alterations			56 26
	Unexplained portion of balance against collector			101 79
				$832 44

SETTLEMENT OF LOUIS MENARD, COLLECTOR FOR 1907.

To	Taxes to be collected ..... Summary	$2,695 66	
By	Collections, 1907 ..... C.B.		$607 40
	Collections, 1908 ..... C.B.		1,364 77
	Arrears carried in roll of 1908 ..... List		572 22
	Balance against collector as per list		151 27
		$2,695 66	$2,695 66

COLLECTOR'S SUMMARY OF ROLL FOR 1907.

——	Assessment.	Rate.	Levies.
	$ c.		$ c.
General Town Purposes	45,523 00	1½%	682 57
Schools:			
Hanme S.S. No. 1	19,978 00	1½%	299 67
Hanmer S.S. No. 2	14,657 00	2 %	293 14
Blezzard U.S.S. No. 2	4,266 00	½%	21 33
Capreol U.S.S. No. 1	16,775 00	2 %	335 50
Capreol U.S.S. No. 2	11,159 00	3½%	390 57
Watercourses:			
Number 1			20 14
Number 2			33 74
Number 3			9 20
Number 4			3 85
Statute Labor Commuted		$1 00 a day	115 00
Tax Arrears, 1906			490 95
Total Levies			2,695 66

EXPLANATION OF BALANCE AGAINST LOUIS MENARD, COLLECTOR FOR 1907.

	Balance unaccounted for		$151 27	
15.	Lalonde, Joseph	Dropped		$6 93
16, 19, 20.	Chenier Hiliare	"		30
16.	Belcourt, Wm.	"		2 00
	Henry, David	Short extended		30
17.	Dubois, Onesime	"		40
19.	Menard, Louis	"		2 00
20.	Chenier, Dominique	Dropped		28 48
	Lizotte, Henri	"		9 60
	Dube, John	"		16 77
21.	Geanveau, Moise	"		3 20
23.	Plante, Havier	"		2 07
	McKenzie & Mann	"		2 07
	Lalonde, Onesime	"		13 20
	Pilon, Maglorie	"		13 20
24.	Laroie, Philias	"		22 93
	Unexplained portion of balance against collector			27 82
			$151 27	$151 27
1.	Belard, John	Short extended		$0 50
1.	St. Jean, Nazaire	"		1 00
1.	Lepage, Alphonse	Crossed out		1 00
2.	Tiny Bros.	Dropped		32 12
6.	Tiny, Jack	"		20 80
7.	Belanger, Elz	"		10 00
8¾.	Dube, John	Crossed out		4 00
	Unexplained portion of balance against collector			31 87
	Balance unaccounted for		$101 29	
			$101 29	$101 29

SETTLEMENT OF LOUIS MENARD, COLLECTOR FOR 1906.

To Taxes to be collected	Summary	$2,884 10	
By Collections, 1906	C.B.		$844 12
Collections, 1907	C.B.		1,604 90
Arrears carried into roll for 1907	List		446 30
To Belanger, Elz, brought forward $92.58 into 1907 roll—should be $82.58		10 00	
Apparently overpaid		1 22	
		$2,895 32	$2,895 32

COLLECTOR'S SUMMARY OF ROLL FOR THE YEAR, 1906.

——	Assessment.	Rates.	Levies.
	$ c.		$ c.
General Town Purposes	42,175 00	1¾%	738 18
Schools:			
Hanmer S. S. No. 1	17,993 00	2.1%	377 86
Hanmer S. S. No. 2	12,431 00	2¾%	341 85
Blezard U. S. S. No. 2	4,508 00	⅝%	37 57
Capreol U. S. S. No. 1	15,922 00	3¾%	597 07
Capreol U. S. S. No. 2	12,001 00	3⅓%	400 03
Statute Labor Commuted		$1.00 day.	105 00
Tax Arrears, 1905			286 54
Total Levies			2,884 10

SETTLEMENT OF NAPOLEON MENARD, COLLECTOR FOR 1905.

To Taxes to be collected	Summary	$1,909 13	
By Cash collections, 1905	C.B.		$370 91
Cash collections, 1906	C.B.		1,277 72
Arrears carried forward to 1906	List.		260 50
		$1,909 13	$1,909 13

COLLECTOR'S SUMMARY OF ROLL FOR 1905.

——	Assessment.	Rates.	Levies.
	$ c.		$ c.
General Town Purposes	43,079 00	1½%	647 43
Schools:			
Hanmer S. S. No. 1	19,746 00	2⅛%	419 61
Hanmer S. S. No. 2	1,233 00	3⅓%	410 54
Blezard U. S. S. No. 2	4,610 00	1 %	46 10
Capreol U. S. S. No. 2	2,326 00	4½%	104 68
Tax Arrears, 1904			192 87
Statute Labor Commuted		$1 25 day.	87 90
Total Levies			1,909 13

SETTLEMENT OF NAPOLOEN MENARD, COLLECTOR FOR 1904.

To Taxes to be collected	Summary	$1,372 69	
By Cash collections, 1904	C.B.		$370 44
Cash collections, 1905	C.B.		725 65
Arrears carried forward into 1905	List		175 31
Balance against collector			101 29
		$1,372 69	$1,372 69

This settlement of 1904 roll, prepared by J. A. Lemieux, ex-clerk, has been gone over with him, but no understanding could be arrived at.

The roll is full of alterations and errors which add to the difficulty of clearing it up.

The ex-collector is bed-ridden and unable to deal with the matter.

The Council will get any further explanation they think are obtainable and deal with the roll finally to the best of their judgment.

COLLECTOR'S SUMMARY OF THE ROLL FOR 1904.

—	Assessment.	Rates.	Levies.
	$ c.	%	$ c.
General town purposes	41,764 00	1¼	522 43
Schools:			
Hanmer S. S. No. 1	22,520 00	2	450 40
Blezard S. S. No. 2	11,948 00	1¼	149 35
Capreol S. S. No. 1	.....	.....	28 40
Capreol S. S. No. 2	.....	.....	88 23
Tax arrears 1903	.....	.....	79 38
Statute labor commuted	.....	$1 day.	54 50
			1,372 69

ROOM 66, CANADA LIFE BUILDING,
TORONTO, 13th April, 1910.

To the Reeve and Council of the Township of East Gwillimbury, Sharon, Ont.

GENTLEMEN,—Under the powers conferred upon me by the Provincial Municipal Auditor, confirmed by an order of His Honour the Lieutenant-Governor-in-Council, I have audited the books of your Township for the years 1908 and 1909 and beg to report as follows:—

The cash book approved by the Department was kept up to the end of the year 1907 and then discontinued. None has been kept since; but to meet the requirements of a receipts and expenditure statement issued annually for the information of the ratepayers, two books of the same character were kept, one presumably being a draft and the other a fair copy (sometimes the one book and sometimes the other giving the fuller detail) in which a record was kept under the various headings of the receipts and expenditure statement of all moneys received and disbursed. The only exception is in the receipts from the Collector for taxes which he paid into the bank from time to time to the credit of the Treasurer, and which were credited by the latter in two bulk sums in the books above referred to. The expenditure was written up from the cheques, which also served as receipts for moneys paid; such statements being duly authorized by the Council.

The roll for 1908 amounted to $17,392.59, all of which was duly paid and credited in that year but $452.23 arrears which were accounted for as follows:—

Credited in 1909, $239.71 less $8.56 percentage.....	231 15
Rebates ordered by Council *re* Canal Construction....	31 75
Arrears carried into 1909 roll (percentage included)..	142 96
Balance dropped (to which add percentage included in $146.96 arrears)	46 37
	$452 23

Full details of the $46.37 can be furnished if desired, but the account is somewhat involved.

With regard to the year 1909, I re-wrote the entire account, entering on your books the assets and liabilities of the Township and opening a current account with the Dominion Bank, Mount Albert, a savings bank account with the same institution, and an account with the Bank of Montreal, Newmarket, with which banks (in which the Township's moneys were deposited) no accounts had been kept on your books, the treasurer treating cash in their hands as cash in his own. To obtain these results I wrote up a cash book, journal and ledger, and if your Treasurer follows the plan I have inaugurated, no taxes can be dropped without leaving a balance on your books unaccounted for.

The plan adopted by the late Treasurer in filling the requisitions made by the treasurers of the different School Sections, was to strike a rate meeting the requirements of the requisition of each School Section as nearly as possible, and sending the actual amount raised by the rate on that School Section to the treasurer of it, thus leaving no balance in his hands and the bookkeeping of the School Section to the treasurer of it. Perhaps it is proper for me to mention here that your present Treasurer sent them the amounts asked for instead of the amounts raised, but the difference amounted to less than $5, and is scarcely worth mentioning. It was done inadvertently and the mistake will not be repeated.

Owing to an error made by the Treasurer of U. S. S. No. 2, King and East Gwillimbury, an over-assessment was made on the ratepayers included in it. Some of these over-assessments were paid to the collector and repaid by him under the authority of the Council, some he rebated, and the balance collected and not repaid now stands at the credit of the School Section on the balance sheet. All these have since been repaid, but an amount of $13.20 due the Northern Division of the Grand Trunk Railway.

The roll for 1909 amounted to $19,483.36, and, with the exception of $712 arrears on the 31st December, 1909, has all been properly accounted for. Many of these arrears have since been paid as well as the balance of $1,119.18, standing against the Collector on that date. Funds not in the bank were not credited to the Collector till they were actually paid in.

All disbursements were duly authorized by the Council.

The bank accounts have been adjusted and the balances agree with the balances on the balance sheet.

The late Treasurer owes a small balance of $20.57, $18.20 of it being an outstanding cheque, thought to have been paid when a settlement was made by his representative with the new Treasurer, and a small balance of $2.37 overlooked in the settlement. The new Treasurer issued his cheque for the $18.20.

On enquiry at the Dominion Bank here for confirmation that they hold $10,000 of the City of Winnipeg debentures for account of the Township, I was told that they had the debentures, but they asked me to write to their Mount Albert branch for information as to whose account they were held for. I have written, and shall forward their reply to your Treasurer for your information.

You will notice on the balance sheet there is only $201 in the savings bank. This is $200 interest collected on Winnipeg debentures to the 1st November, 1909, and $1 interest on the savings bank balance to the 31st December, 1909. The $1,122.90 principal was drawn out, $500 to lend to S. S. No. 5, and the balance of $622.90 as a loan to the Township with a balance of $5.55 accrued interest. The loan to the Township has been repaid with interest, but the loan to S. S. No. 5 is still outstanding, and bears interest at 6 per cent.

Nothing herein contained is intended to cast the slightest reflection on the entire integrity of your late Treasurer.

I attach a statement of receipts and expenditure, and a balance sheet as of the 31st December, 1909, and add a few recommendations for the Treasurer's and Collector's guidance.

1. The roll should be proved on each page by seeing that the assessed taxes, statute labour, arrears and dog tax agree with the total.

2. The Collector should be charged with the total of the roll when it is handed to him; credited with the payments on account as made, and he should hand to the Treasurer a list of arrears when handing the roll back, giving the number on the roll, ratepayer's name and the amount in arrear, the amount of which added to the amounts he has paid in should agree with the total of the roll. The roll and list of arrears should be handed in not later than the 31st December.

3. The Collector should hand to the Treasurer with each payment he makes a list giving the No. on the roll, ratepayer's name and amount of each collection, the total of which should agree with the payment he makes.

4. In crediting arrears, the No. on the roll, ratepayer's name and amount collected should always be given.

5. The reports of overseers of road divisions should be filled in with more care. Some of them are not signed and on others it is open to question whether

the work has been performed or not. When received by the clerk, if not properly filled in the report should be at once returned with instructions how to correct it so as to make the meaning clear.

The accounts of the Township ought to be closed on the 31st December of each year. The effort to keep them open beyond that date will surely lead to entanglements similar to the one which has just been unravelled. A memorandum can be inserted in your statement of receipts and expenditure stating how much of the arrears has been collected since the closing of the books.

All of which is respectfully submitted.

Your obedient servant,

H. R. MORTON,
Auditor appointed by the Provincial Municipal Auditor.

TOWNSHIP OF EAST GWILLIMBURY.

ABSTRACT OF ACCOUNTS FOR 1909.

Receipts.		Expenditure.
$663 25	Balance on hand, 30th December, 1908	.....
356 65	Salaries and miscellaneous	$1,301 26
346 00	Dog Tax	73 57
712 25	Clergy Reserve Interest	505 70
1,182 00	Legislative Government	1,182 00
370 60	County Grant	370 60
.....	Indigent	21 85
.....	Board of Health	164 47
32 18	U. S. S., No. 2, King and East Gwillimbury	.....
18,656 30	Assessed Taxes	13,459 67
1,438 30	1908 Roll	1,410 88
4,000 00	Debentures, S. S. No. 5	4,000 00
1,122 90	Dominion Bank, Savings	.....
.....	S. S. No. 5 (Loan)	500 00
356 05	Roads and Bridges	3,577 40
.....	A. J. Hughes	20 57
.....	Collector, (paid after 31st December)	1,119 18
.....	Dominion Bank, Current account	1,308 70
.....	" " Savings "	201 00
.....	Cash	19 63
$29,236 48		$29,236 48

The $1,438.30 was 1908 taxes credited in the 1908 account.

The $1,410.88 was $1,100 borrowed from the Savings account and returned in January, 1909, the balance, $310.88, being the balance on hand paid over to the new Treasurer out of the $663.25 on hand at the beginning of the year.

Certified correct,

H. R. MORTON,
Auditor appointed by the Provincial Municipal Auditor.

BALANCE SHEET, 31ST DECEMBER, 1909.

School Funds Assets	$12,974 43
General Debenture Account	6,929 34
Clergy Reserve Interest	206 55
U. S. S. No. 2, King and East Gwillimbury	32 18
Surplus Assessments	2,532 89

Winnipeg Debentures	$10,000 00		
Township	1,851 53		
S. S. No. 5	500 00		
		$12,351 53	
S. S. No. 5, Debentures	$4,000 04		
" " 6, "	2,177 98		
Queensville, S. W., Debentures	751 32		
		6,929 34	
Arrears		712 00	
Dominion Bank Savings		201 00	
A. J. Hughes		20 57	
Collector		1,119 18	
Bank of Montreal, Newmarket		13 44	
Dominion Bank, Current		1,308 70	
Cash in Treasurer's hands		19 63	
		$22,675 39	$22,675 39

$12,974 43
12,351 53

$622 90 Due by the Township to School Fund which has since been repaid with interest by a cheque on the Dominion Bank.

The surplus assessments, $2,532.89, is principally represented by the cash in the banks and the amounts due by A. J. Hughes, the Collector and Treasurer, as shown by the above balance sheet.

Certified correct,

H. R. MORTON,
Auditor appointed by the Provincial Municipal Auditor.

July 2nd, 1910.

J. W. Sharpe, K.C., *Provincial Municipal Auditor, Toronto:*

Dear Sir,—Acting under the authority of an Order-in-Council of date the 24th of February, 1910, and following the instructions of yourself, I have made an inspection, examination and audit of the books, accounts, vouchers, and moneys of the Municipality of the Town of Port Hope, comprising the assessment and tax rolls, cash book, ledger and journal of the Treasurer of the Municipality, the books of the High and Public School Boards, the books of the Board of Harbour Commissioners, and the books of the Board of Water Works Commissioners, all for the several years from the 31st of December, 1904, to the 31st of December, 1909.

I went to Port Hope on the 3rd of March and commenced work.

The occasion for the request to the Government desiring the special audit was a certain dissatisfaction regarding the audits which had been made in previous years, giving the impression that the funds of the Municipality had been carelessly and even dishonestly handled. The charges were as follows:—

First, That the taxes had not been closely and promptly collected.

Secondly, That cheques had been drawn in the name of the School Board, which had been used by private individuals.

Thirdly, That the accounts of the Harbour Master had not been kept exactly, and there had been losses to the Board of Commissioners.

Fourthly, The general sentiment of distrust had become so intense in some sections of the community that a motion was carried in the Town Council and a petition forwarded to His Honour the Lieutenant-Governor, of which the following is an extract:

"Your petitioners therefore pray that Your Honour will be pleased to direct that an official audit be made of all the books and accounts (Municipal, Harbour, Water Works, and School) of the Town of Port Hope from the first day of January, 1905, to the 31st day of December, 1909."

On the 5th of March, after an inspection of the tax roll and cash book for 1905, at the request of the Mayor, I addressed a letter to the Council, drawing its attention to the said roll, and the balance then still due upon it, which the ex-Collector was desirous of clearing off, and which he did by his own cheque. The following report of the Council meeting in the issue of the *Guide* newspaper of the 7th of March gives the facts of my letter, the settlement of the balance for 1905, and a reference to some other matters indicating the public desire for a general and specific audit as asked for.

The Evening Guide, Monday, March 7th, 1910.—"A special meeting of the Town Council was held last Saturday evening and the members were all present, with the exception of Reeve Long and Councillor Russell. The meeting was called to consider the advisability of auditing the books for the past five years. The Mayor's suggestion to have the Water Works and School books audited for 1909 only did not meet with the approval of the Council. The members all favoured a five-year audit, and it was moved by Mr. Fulford, seconded by Mr. Patterson, that in respect to the Provincial audit of the books and accounts and having regard to the best interests of the ratepayers, this Council stands by the resolution passed at this Board at the regular meeting held on January 14th, for a five-year audit of all books, commencing with January 1st, 1905.

"A communication was received from M. Jeffers, the Government Auditor, furnishing a statement of certain tax arrears for 1905. The total roll for 1905 was

$39,586.54. The cash for taxes for 1905, $23,404.04; cash received in 1906 on account of taxes of 1905, was $12,437.96. The exemptions of 1905 were $1,860.50; the arrears for 1905 were $1,225.13. The total roll of 1905 accounted for was $38,927.63, while the total roll was $39,586.54. This left a balance unaccounted for of $685.91. Tax Collector Evans had sent in three checks amounting to $448.86, leaving a balance still due of $210.05. This balance was settled in full on Saturday by Mr. Evans.

"The balance of $210.05 is made up as follows: J. P. McKenny, $86.87; Mrs. ——, $6.60; Mr. Nolan, $15.00; C. A. Merrifield, $93.83; Harry Eldridge, $1.25; James McLean, $7.50; total $211.05, less overpaid by Collector, $1.00, leaving a balance of $210.05.

"This amount, as stated before, was paid by Mr. Evans on Saturday, but he feels that he is entitled to a refund of three of these amounts, namely, the $6.60 paid for Mrs ——, $1.25 paid for Harry Eldridge, and the $7.50 against Mr. McLean was income, and Mr. McLean being a householder, claimed exemption. In the matter of Mr. Merrifield's taxes, it might be explained that his taxes for 1905 amounted to $100. The following year he gave a check for $58.25, and marked off an account he had against Mr. Evans for $41.73. He received his receipt and thought the matter all settled.

"The roll of 1906 is found to be without arrears. Mr. Jeffers asked the attention of the Council to the matter of income taxes which he was led to understand had complicated the Collector's roll for 1907 and 1908. If they intended to give this matter any consideration by way of by-law, he asked them to do the same at their earliest convenience.

"Mr. Dingwall was present and made the statement that the School Board had issued a check to one of its members for $485.00, but Mayor Giddy refused to sign the same. The check had been returned and he thought this was a matter which should be looked into.

"The only question to be decided by the Council now regarding 1905 taxes is in reference to the penalty of 10 per cent., which is levied on all unpaid taxes after May 1st."

I have made a full reference to the proceedings of this meeting of the Town Council for the reasons that therein are stated by the leading town newspaper, the exact debate of the Council in session upon the several points mentioned as the grounds for the audit. The instance of the roll of 1905 illustrates the want of care regarding the collection of taxes. There did not seem to be any purpose of defrauding the Municipality, but the Collector had undertaken too much work, being not only Tax Collector, but also Harbour Master, with sole charge of that property under its Board of Commissioners.

From the 5th of March, I continued the examination and audit of the Municipal books, and devoted six weeks to a thorough search, comparison and proving of the several accounts, commencing with the assessment and tax rolls for each of the five years and carrying the comparison through the several books, cash books, journal and ledger for each item.

The assessment rolls and Collector's rolls have been duly compared and proved for each year of this audit. The Collector's roll has also been proved from the Collector's blotter, entries in the cash book, and the arrears ledger. An example of taxes and method of collection has already been quoted in 1905 rolls, and was duly rectified with interest added. The uncollected roll for 1905 was completed in 1910. The taxes on the roll for 1906 were reported on 31st December that year as $13,911.90 uncollected, which amount was paid in 1907 and so

reported. This proper example was not maintained regarding taxes of 1907, which showed in 1908 an uncollected amount of $337.40, and for 1909 showed recharges of $231.62, making the balance against 1907 of $569.02, as per ledger.

The roll for 1908 shows $4,641.45 as accounted for in 1909, viz., cash, $4,025.13 and arrears per ledger, $616.32. Add to these items balance due 31st December, 1909, $845.12 and the total against this roll 31st December, 1908, is wholly accounted for.

But comparing total arrears account, 1908, with like account, 1909, shows a difference of $101.22, which must be recharged in ledger against the following accounts: Lands, $53.56; personal, $4.10; Water Works, $8.88; harbour, $112.45; contra credit, town lots, $77.77, yielding above balance, $101.22.

The roll for 1909 showed at 31st December that year, $4,498.29 yet to collect. The new Collector, Mr. A. D. Cheshire, has, however, by his industry, been able at date to collect a large part, and account for his total roll. The exemptions and remissions are very large this year, but "penalties" are being well paid.

"Income tax rates" have been resisted for several years, and, I beg, along with this report, to submit a full list of items due on "income taxes." I have urged, on several occasions, that these be dealt with candidly, either collected, or cancelled as assets. The Treasurer, Mr. J. D. Smith, the ex-Collector, Mr. J. Evans and myself dealt carefully with each item. The whole list should be taken up by the Council. The amount, $1,441.99, is too large to be allowed to go by default. The law regarding them has been amended at least twice, and various Councils have had them under consideration, but they *still stand*, as shown here.

The *first charge made,* "that taxes had not been closely and promptly collected," as shown above, has been examined according to facts. There is no evidence of any attempt to defraud the Municipality. There has been some dilatoriness in keeping his record, and several instances where in "kindness" cross-transactions were entered into and taxpayers "helped out." The ex-collector was not a man who coveted any of the items of the rolls in his hands.

The *second charge,* as against the School Board, has been inquired into and found to be an error of judgment. The School Board has always been dealt with by the Town Council in an open and generous manner, but some members of the Board held the idea that it would be "thrifty" to have a fund in hand which could be drawn upon for repairs and expenses, or even as a nucleus for building purposes. This is contrary to Acts governing the financial relations of the School Board and Town Council. This was becoming a yearly habit, until Mayor Giddy, in 1908, refused to sign a cheque for $485.38 on building account—See statement No. 7 in audit report for that year. I cannot find that these cheques were ever used as charged, and the one mentioned above is dealt with as reported in 1909 audit report. That there was any fraud, as charged, was not possible, as an account of these items was kept in the Midland Loan Co., and the special bank book was held by the Treasurer.

The Town Clerk—Mr. J. W. Sanders.

The assessment rolls and Collector's rolls for the several years were all prepared by or under the care of the Town Clerk, and are simply complete in form and details, such as, noting of the changes made by the Court of Revision, notices to taxpayers, dates of payment, full summaries, additions and certificates. No Municipality, urban or rural, can show more accurate or neater book-work. His vault bears the like evidence of care and value for ready reference. Minutes, pay-rolls, by-laws, are in complete order.

The Treasurer—Mr. J. D. Smith.

The cash book, journals and ledgers are continuous and complete in subject and order for reference. By them the annual audit reports have been checked for 1905, '6, '7, '8 and that for 1909 has been compiled. The journal and ledger are kept up to date and after the most approved manner, Mr. Smith having been a business man and banker of large experience, so that he is an authority on the disposition of all items which come to his office. In the matters of tax arrears, his ledger gives a succinct, continuous statement, and the Acts relating to these. He and the clerk work together in carrying them out. The same working together applies in the case of the rolls and all vouchers.

Cash Book.

Every item herein was proved and the whole checked as to totals, the bank columns therein compared with the columns for receipts and disbursements, and with the bank's book. In the three years for 1905, '6, and '7, there were a few cross-entries in correction of differences between vouchers and the facts. The balance of cash was in every instance preserved. These had been noted annually by the local auditors. For example, in 1905 these cross-entries amounted to $43.91, viz., fol. 57, $5.00; fol. 60, $38.61; and fol. 74, 30 cents.

In 1906 amount $40.47, viz., fol. 73, $15.15; fol. 100, $17.87; fol. 82, $2.45; and fol. 98, $5.00.

In 1907, amount $103, viz., fol. 103, $3.00; fol. 121, $100.00. 1908 and 1909 clear.

The items of cash book for 1909 are given in the printed report for this year. In the printed report, I think the item "Police Dept. Exps," should read $118.76, a difference of 10 cents. The total of disbursements, however, is correct.

Fire insurance on Municipality's property is $32,800, as shown on return herewith.

Harbour Master—Mr. Jas. Evans.

This officer was also Tax Collector during the years under inspection until August, 1909. His work therein has already been reviewed.

With regard to the Harbour books, he was as anxious for their examination and audit as in the case of the tax books, and I spent five weeks with him examining every item in the import and export books, traffic and Customs ledgers and cash books, and checking with inwards and outwards bills, Customs' vouchers and the statements obtained from the steamboat offices. Then I audited all these alone and checked to prove former work and audits. There is a report for each year in each annual audit. I furnished that for 1909, and at the same time checked a gross account for the five years, which I submit herewith, and also the cash proof of the balance of gross account closing all these years. My certificate of audit will be found on page 148 of the Harbour ledger.

High and Public Schools.

The statement of accounts of these are shown in the Annual Report for 1909. The items for the five years were checked, the additions proved. The audit occupied one week. All items were compared with vouchers and bank books, and should be a matter of satisfaction to the ratepayers.

BOARD OF WATER COMMISSIONERS—SECRETARY, MR. R. GRAY.

The audit of the books of the Commissioners occupied three weeks, comparing the registers of rates flat and meter, cash book and ledger, bank books and vouchers, and minutes of the Board, and found correct. The only error was one of 10 cents in the cash book, a matter of transposition of figures in one item. The total was correct, the error being probably in copying.

The books are not only correct, they show painstaking care in their inner work, and adaptation to mark details and results.

Mr. Gray, having been a companies' officer in England, has had a large experience, which has been given unstintedly to the service of the Corporation.

The above named officers have placed all information at the convenience of this audit. The Corporation also aided by the services of Mr. Choate.

The audit was arduous from the nature of the charges and required the utmost attention notwithstanding the unchallenged reputation of most of the officials.

I have the honour to be,
Sir,
Faithfully yours,
J. FRITH JEFFERS.

FIRE INSURANCE, 25TH MAY, 1910.

Fire Hall	$3,000 00	Phoenix.
Town Hall	5,000 00	"
Town Hall	3,000 00	London.
Town Hall	5,000 00	Equity.
Firemen	15,000 00	London, Guarantee & Accident.
West End Fire Hall	500 00	Phoenix.
Tool House	500 00	Western.
Hook and Ladder	400 00	Canadian Fire, Winnipeg.
Grand Stand	250 00	North American.
Town Park Pavilion	150 00	
	$32,800 00	

J. F. J.

PORT HOPE.

STATEMENT No. , WATER WORKS, 1909.

Detail of Work Performed, and Cost.

Years.	Gallons pumped yearly.	Daily average.	Coal used, tons.		Cost.
			Hard.	Slack.	
1905	55,386,900	151,745	254	36	$1,297 90
1906	58,039,100	156,271	276	36¾	1,112 93
1907	55,896,700	153,000	295	30½	1,630 72
1908	49,486,500	135,580	274¼	27½	1,414 42
1909	52,731,200	144,469	352¼	22½	1,505 92
	271,540,400	.....	1,451½	153¼	6,961 89

According to Books:—Average coal per 1,000 gallons equal to 10¼ pounds.
On hand 31st December, 1909, 61 tons hard coal and 15 tons slack.

J. F. J.

HARBOUR, PORT HOPE.

GROSS ACCOUNT FOR YEARS 1905 TO 1909.

To Balance, 1904		$572 73	By Salary of Harbour Master for 5 years		$2,500 00
1905 To Tolls	$1,645 21		1905 By Coupons....	$1,350 00	
1906 " "	1,295 07		1906 " "	1,350 00	
1907 " "	1,122 90		1907 "	1,350 00	
1908 " "	739 02		1908 " "	1,350 00	
1909 " "	1,089 07		1909 " " Corporation acc.	700 00	
		$5,891 27			6,100 00
To Rents—			1905 " Expense ...	129 86	
1905	127 50		1906 " " ...	261 37	
1906	884 71		" " Mitchell's Horse (Loss)	25 00	
1907	925 00		1907 " Expense ...	136 27	
1908	1,007 50		" " " Coal Buildings ...	475 00	
1909	978 00		1908 " Expense ...	79 76	
		3,922 71	1909 " " ...	331 76	
To Drafts—					1,439 02
1907 " "	195 43		" Miscellaneous—		
1908 " "	354 91		1905-6 " Insurance.	$166 05	
		550 34	1909 " Interest ...	21 29	
1909 Over-deposit in Bank	$75 00	75 00	" " Drafts	550 34	
					737 68
			" Balance		235 35
		$11,012 05			$11,012 05

J. FRITH JEFFERS.

CASH ACCOUNT—PROVING BALANCE OF GROSS ACCOUNT.

1909. *Bank of Toronto.*	Dr.			Cr.	
To Balance	$1 24		Jan. 7 By	$12 30	
Jan. 1-30	61 05		Apl. 8 "	125 00	
Apl. 28	305 50		May "	55 50	
Sept. 30	125 00		June 30 "	125 00	
Dec. 7	603 00		Sept. 30 "	125 00	
" 15	183 30		Dec. 31 "	125 00	
" 20	18 17		" " Coupons....	700 00	
		$1,297 26			1,267 80
1910.			By Draft of 1908	$354 91	
Jan.	50 00		" Balance in Bank....	131 25	
"	125 00				1,753 96
"	150 00				
Feb.	56 70				
"	50 00				
"	25 00				
		1,753 96			

Cash Book, pp. 268.

To Cash $40 39			" Interest per Cash Book		21 29
" 'Phone refund. 10 00			" Balance of Harbour act. in Gross.....		235 35
	50 39				
" Over-deposit	75 00				
		125 39			
" Balance from bank account		131 25			

J. FRITH JEFFERS.

To His Honour The Lieutenant-Governor-in-Council,
Parliament Buildings, Toronto, Ontario.

YOUR HONOUR:

TOWNSHIP OF TILBURY WEST.

The authority to me bearing date of May 31, 1910, received through the Provincial Municipal Auditor, J. W. Sharpe, Esq., was exercised in conducting an audit of the books, accounts, vouchers and moneys of the above Municipality, the same being brought to a conclusion to December 31, 1909, and by a resolution of the Township Council, bearing the date August 13, 1910, I was requested to assist the Clerk to get all shortages, refunds, etc., that might be discovered, adjusted as far as possible on the 1910 roll, which has been carried into effect.

The petition praying for a special audit set forth certain charges and requests as sufficient reason for such an audit and in this report and accompanying statements it is sought to cover the charges and requests of the petitioners.

MINUTES.

The minutes are generally well recorded, but there are some irregularities apparent, which I will mention: 1904 meetings recorded on pages 211 to 213, not signed by Reeve. Pages 216 to 218 not signed by the Reeve. Pages 222, 227, 228, not signed at all, page 235, date of meeting not shown. Page 253 not signed by Reeve. Page 279 not signed by Chairman. Page 445, date of meeting not inserted. Page 474 not signed by Reeve. Through the years 1904 to 1909, there are numerous cases of two or more minutes of previous meetings being confirmed at one time, instead of the minutes of last meeting being confirmed at the next one, as should always be done. The payments made by the treasurer are always ordered by a resolution. I cannot find that any payments other than those to School Sections have ever been made, without having first been passed by resolution.

BY-LAWS.

There are a number of irregularities amongst the by-laws.

By-law 103, of 1904.—Comber Silex Walk. Not sealed and no evidence of registration.

By-law 105, of 1904.—Appointing Assessor. Not sealed.

By-law 106, of 1904.—Silex Walk debentures. Not signed, not sealed, and no evidence of registration.

By-law 109, of 1904.—Appointing Engineer to make report on Big Creek Drain. Not sealed.

By-law 110, of 1904.—To confirm agreement between Townships of Tilbury West and Rochester, regarding West Town Line Drain. No evidence of registration.

By-law 113, of 1905.—Nickell Drain. No evidence of registration.

By-law 119½ of 1905.—Minutes of September 9, 1905, confirm passing of by-law appointing drain inspectors, to take effect from date of passing. There is no date on by-law.

By-law 124, of 1905.—For taxes to be paid into bank by taxpayers. Not sealed.

By-law 122, of 1905.—To repeal part of by-law 88½. Not signed, not sealed.

By-law 125, of 1905.—Nominations, etc., for 1906 Municipal Election. Not sealed.

By-law 126, of 1905.—Names and amounts to be levied and debentures to be issued, No. 2 Government Drain. Not sealed.

By-law 129, of 1906.—Names and amounts to be levied, 7th Concession extension Drain. Not sealed, no evidence of registration.

By-law 137½, of 1906.—Franchise to Telephone Company. No evidence of registration.

By-law 138, of 1906.—Collector to pay taxes in to Treasurer every 7 days. Not dated.

By-law 141, of 1907.—Appointing Township Officials for 1907. Not dated.

By-law 143, of 1907.—Franchise for piping roads, streets, etc., for gas or oil. No evidence of registration.

By-law 143, of 1907.—To confirm settlement of appeal between Townships of Tilbury West and Rochester, regarding Engineer's report. No evidence of registration.

By-law 144, of 1907.—Appointing Collector for 1907. Fixes salary, but does not fix or define duties.

By-law 146, of 1907.—Names and amounts to be levied and issuing of debentures, No. 3 Government Drain. No evidence of registration.

By-law 149, of 1908.—Franchise for piping roads, streets, etc., for gas and oil. No evidence of registration.

By-law 152, of 1908.—Names and amounts to be levied and issuing of debentures, Turnbull Drain. No evidence of registration.

By-law 155, of 1908.—Names and amounts (6 and 7 Side Road Supplementary) to be levied and issuing of debentures. Not finished, not signed by Reeve, not sealed, no evidence of registration.

By-law 157, of 1908.—To construct sidewalk in Village of Staples. Not signed by Reeve.

By-law 162, of 1909.—Franchise for piping roads, streets, etc., for natural gas, and to erect telephone service. No evidence of registration.

By-law 165, of 1909.—Names and amounts to be levied for constructing Silex Walk in Village of Staples. Not signed by Reeve, not sealed, no evidence of registration.

By-law 167, of 1909.—Franchise to supply oil and gas to Village of Comber. No evidence of registration.

By-law 171, of 1909.—Regarding Local Option. Not signed by Clerk, not sealed.

By-law 17.—Police Village of Comber. Silex Walk, names and amounts to be levied, issuing debentures, etc. No evidence of registration.

By-laws 10 and 11.—Police Village. Silex Walk, names and amounts to be levied, issuing of debentures, etc. Not signed by inspecting trustee. Not sealed, not dated, no evidence of registration.

Cash Book.

The usual municipal book is in use, but it is not very carefully kept. Dates are conspicuous by their absence. The columns headed Miscellaneous appear as a common refuse heap for anything that is a little out of the ordinary. As all cash is paid into the bank, and all payments made by cheque, the debit, credit and

balance columns of the bank portion of the book should be used. There never is any cash on hand, so these columns need no attention. The entries are made as if time to make them neatly and carefully, affording all necessary information possible, was never available. The least part of the Treasurer's work is to keep his cash correctly, especially when he handles so very little as this one does. If my suggestion be adopted, that the vouchers are returned monthly and the Treasurer go over them carefully, and never allow his posting to fall more than one month in arrears, I would expect to see a great change for the better in the Township's bookkeeping.

The Ledger.

The accounts are not kept very neatly, nor do they afford sufficient information. There are not quite enough of them either, and one or two prominent accounts are not there at all.

A General Fund account should be kept. It should be credited with the Township levy and the dog tax. At the end of the year the various accounts paid out of the General Fund should be closed into it. The standing then of the account will afford a good foundation for basing the rate to be struck for the next year. An account should be kept for the General School rate, credited with the levy and debited with the apportionment to the various schools. This will also be a safe and reliable guide as to the rate to be struck for the next year. An account should be kept for the General Road Drainage, and it should be treated about as I have pointed out for the General School rate. These accounts and this treatment of them should prevent one rate being struck too high and another too low. Road drainage shows too much money collected, General School rate shows too little money collected. The Treasurer should communicate to the Council vagaries he ought to observe in the accounts, and ask for instructions, or suggest, himself, treatment of them. The standing of any account should be watched over carefully by the Treasurer and freely commented upon by him to the Council. At the present time if the Road Drainage, which should be even or nearly so, did not run to a large surplus, the Township would be in debt.

Assessment Rolls.

These are fairly well made out, and the Statutory conditions are observed. There are very few appeals sustained by the Court of Revision.

Collector's Rolls.

These are well prepared. There are a number of variations in the Special rates, but in almost every case it has been caused by circumstances beyond the Clerk's control. The Village of Staples consists merely of portions of the adjacent farm lots, being sold as village lots, sometimes from a plan and sometimes without one. A number of these have reverted to the farm lots, and an assessment for a drain is almost impossible to accurately locate. The Police Village of Comber has had three separate surveys and a bewildering condition of affairs exists. I would urge very strenuously upon all parties concerned the immediate and absolute necessity of having a new plan made of the Village.

Both of these circumstances are largely the cause of the numerous discrepancies which have had to be put right on the 1910 roll, and unless steps are taken to have new plans prepared, the Municipality may expect to have them every year.

Village of Comber.

The trustees hold their monthly meetings with fair regularity the evening before the Council hold their monthly meetings. I notice their minute book is not signed as regularly as it should be. They do not pass all accounts that they pay. The inspecting trustee, himself, issues checks without any authority but his own, presumably, and does not always get them ratified at the next Council meeting. They keep no accounts other than one general one in the Township ledger, and in another place I have suggested they should improve their system of bookkeeping.

Insurance.

An insurance of $1,500.00 is carried on the Town Hall, no insurance on contents. As a good deal of money has been expended this year upon repairs and improvements on the building, and as the contents have also been materially added to, I would suggest that a re-valuation be taken and more insurance put on the building, and all that can be procured be had on the contents.

Treasurer's Bonds.

The Township Treasurer, W. A. Keith, has $7,000.00 Dominion of Canada Guarantee and Accident Company bonds. A receipt was produced showing the bond in force until March 10, 1911. He also has $2,000.00 private bond, signed jointly and severally by himself and two brothers. As the brothers are farmers, each possessing a good farm with ample assets to meet the liability under the bond, this is a good bond, and as all cash is deposited in a chartered bank and all payments made by cheque, the bonds would appear to be ample for the security of the Township.

Collector's Bonds.

The Collector for 1910 has been appointed, but not having assumed office or having had the roll delivered to him, at the date I left the municipality, his bonds had not been presented to the Council.

The Balance Sheet.

School Section No. 5, Public.—There was an error of $20.00 in crediting the levy made in 1905, which has never been corrected. The balance due the section is $196.20, instead of $216.67, as shown in the account.

Sheep Killed.—The practice of crediting this account with total dog tax yearly, and debiting all moneys paid for sheep killed, refund dog taxes, etc., does not appear to me to be a good one. There should be a separate account kept for refunded taxes and another for sheep killed, and kept so as to show what had been paid for sheep killed, and what had been refunded in taxes. It would be much better to give the General Fund credit for the dog tax, and at the end of each year close the above accounts into the General Fund. When the council passes a refund resolution, if it is to be paid in cash, a warrant should be issued and the sum credited in the cash book, and debited to refund tax account. If not paid in cash a journal entry should be made debiting the refund tax account, and crediting the Tax Collector, referring in the journal entry to the Council's resolution.

Township of Rochester.—An account should be opened in the ledger for this by a journal entry debiting General Fund and crediting the Township of Rochester, with explanation to show what it is.

Police Village of Comber.—There is an amount of $5.10 in debit of Comber Silex Walk account, which appears to have stood still since 1904. This amount appears to be owing by the Village to the Township. A journal entry should be made crediting Silex Walk and debiting Police Village. There is a wrong entry on page 107 of 1906 cash book, by which the M. C. R. R. assessment is credited to the Village as $57.46, but as the bank pass book shows only $47.46 as received from the M. C. R. R., there is $10.00 due by the Village to the Township, which also requires a journal entry to straighten out, debiting village and crediting General Fund. There is an error in the roll of 1906. The Village was over-credited $8.00, which they refunded in dog taxes, but the roll totals $8.00 less than the credit given the Village in the levy; this also requires a journal entry debiting Village and crediting General Fund.

No. 1 Government Drain By-laws 93 and 97.—There is an evident surplus of $30.35 in this account which should be adjusted by the Council passing a by-law and refunding *pro rata* this amount to the lands assessed under the above by-laws.

Malden Road Drain By-law 47.—There is an evident surplus of $27.30 in this account which should be adjusted by the Council passing a by-law and refunding *pro rata* this amount to the land assessed under above by-law.

Six and 7 Side Road Drain By-law 29.—An amount of $84.04 has been standing to the credit of this account since January 1, 1904. After much research and enquiry it cannot be discovered why it is there. It would be advisable for the Council to pass a resolution transferring this to the General Fund. It could remain there, and if any claims are ever established for any part of it, which appears very unlikely, they could be paid from the General Fund. The passing of a journal entry is necessary if my suggestion is adopted.

No. 4 Government Drain By-law 46.—The credit of this account, $19.00, through an error in bookkeeping, has been allowed to remain here. It belongs to the Roads and Bridges Account, and a resolution should be passed, transferring the sum to where it belongs, by a journal entry.

No. 2 Government Drain By-laws 126-127.—There is an evident surplus of $37.12 in this account which should be adjusted by the Council passing a by-law and refunding *pro rata* this amount to the lands assessed under above by-laws.

Ruscomb Drain By-Law 142.—This is the remainder of a sum due as a refund to the lands assessed under by-law 91. A journal entry should be made for $12.88, the Township's share for roads assessed, and the balance carried to a refund account, remaining there till the cheques come in. I would suggest that when there are a number of small items due on a refund—1, 2, 3, etc. cents only—instead of drawing a cheque and mailing it at a further cost for postage, it would be preferable to refund them on the tax demand. A number of cheques drawn on this refund will probably never be presented.

Turnbull Drain By-laws 152, 153.—A journal entry should be made crediting General Fund and debiting this account. This sum is the roads portion of both by-laws, and should have been placed to the credit of the General Fund when the levy was first entered. The levy is wrongly entered in the first instance in charging roads portion and not crediting General Fund for same amount.

West Town Line Drain By-law 132.—Warrant 830, issued Dec. 15, 1906, was debited to this account in error. It should have been credited, leaving a balance of $1,080.33 to the credit of the account instead of $755.09, as is there on Decem-

ber 31, 1906. Further payments of $1,070.00 in 1907 and a receipt of $90.00 from the Township of Rochester in 1907, reduced the credit balance to $10.33, which should be there now, instead of a debit balance of $224.91, which the account shows at present. To put the account straight it is necessary to pass a journal entry debiting the General Fund $235.24 and crediting West Town Line Drain $235.24 with reference to this audit.

The proper amount, credit balance $10.33, is an evident surplus and should be adjusted by the Council passing a by-law and refunding *pro rata* this amount to the lands assessed under by-law 132.

Six and 7 Side Road Drain.—This is a surplus due from the Township of Tilbury North. It was received from them in 1909, see cash statement. A refund by-law, No. 170, was passed in 1910, and cheques issued accordingly.

Fees and Fines.—A journal entry should be passed crediting General Fund and debiting this account.

Refunds.—From the attached statements it will be clear how this is arrived at.

S. T. Anderson, Balance.—See general report as to this.

Arrears of Taxes.—From the attached statements and copies obtained from the County Clerk it will be seen how this is arrived at, the account in the ledger should be corrected to agree with the statement.

Staples Silex Walk.—There is an item covered by warrant 598 (see cash book page 59) charged to Roads and Bridges which should be charged to this account. A journal entry should be passed debiting this account and crediting Roads and Bridges, for damage done, and paid for, to the sidewalk.

Seventh Concession Extension Drain	2 00
Eighteen and 19 Side Road Drain	5 19
Plouffe Drain.	5 74
Kinsman Drain	15 20
Malden Road East Drain	14 11
Malden Road Outlet Drain	10 39
Big Creek Drain	446 28

The Council should pass supplementary by-laws for each of these accounts, charging the amounts set opposite drain to the lands and roads assessed for the drains, and recover them on the 1911 roll.

Alexander Drain.—There are about 100 assessments to which this small amount would require to be charged in order to charge the lands and roads assessed for this drain. I would suggest instead of the Council passing a supplementary by-law and charging it to the lands and roads, they pass a supplementary by-law charging it to the General Fund, the special road drainage now being so much in excess will permit of such action.

L. & St. C. R. R. Bonus.—This appears to be under-collected to this amount, the deficiency has been charged on the 1910 roll. General Fund should receive credit for this amount in posting the 1910 levy.

Provincial Audit Various.—A statement is attached showing how this is arrived at.

Robb-Dales Drain Bridge.—This account got confused with the Robb-Dales Drain account in the ledger. The drain account proper is closed even, and the bridge account shows a debit balance of $493.91. No debentures were issued for the construction of this bridge, therefore the amount levied on the 1910 roll should be credited to this account and $162.00 principal, plus $9.23 interest,

charged to the Township of Mersea, account of this bridge. This will still leave a debit balance of $233.94, which is due to be collected *pro rata* from the Townships of Mersea, Tilbury North and Tilbury West, according to the original assessment.

Township of Mersea.—Under an engineer's assessment of June, 1908, for the repair of the Robb-Dales Drain Bridge this Township was assessed for $162.00, which does not appear to have ever been received. Under an engineer's assessment of March, 1906, for the repair of the Reid Drain, Tilbury West was assessed $50.00 for their proportion of road drainage for the Town Line Road, which does not appear to have ever been paid.

I have attached a statement showing the position of affairs, and would suggest that immediate action be taken to obtain a settlement, even if it goes as far as a suit.

An adjustment should now be made in the township ledger to bring the Robb-Dales Drain account and the Township of Mersea account into agreement with the figures shown. As the $162.00 and interest appears in the Mersea account, the balance in the Robb-Dales Drain Bridge account will be reduced that amount and should now show $331.91, which I make to be the correct debit.

S. T. Anderson, Balance.—See general report as to this.

Public Schools.

I would like to draw Trustees' particular attention to the fact that duty and self interest invariably conflict. I cannot think that any individual trustee has a right to enter into any kind of a contract with the board of which he is a member. Naturally he will sell to the best advantage and the board should buy to the best advantage. I cannot see how there can be a particularly good bargain, or even a fair bargain, where individual trustees traffic with the school board. I would also beg to draw Treasurer's attention to the fact that they should not pay out any money for which they have not got an order to do so from the board, any more than a bank would pay out money without an order, also that all matters relating to the books, accounts, vouchers, receiving and paying of moneys are public, not private, property, also that vouchers, etc., should be obtained and preserved and handed on from one Treasurer to another for all time. (Receipts should in every case be obtained for all payments, intelligible receipts, and they should be preserved), also that they hold the responsible position of Custodians of the public money and that they and not the auditors keep the accounts; their's is the duty, not the auditors', of seeing that every cent is received and spent as authorized. They should balance their books, obtain and preserve receipts and have something to show for every cent they obtain, retain or disburse. They should keep a book showing on the left hand side date received, from whom received, for what purpose received and amount received, and showing on the right hand side, date paid, to whom paid, for what purpose paid, and amount paid. This is how a cash book should be kept. Then again nothing should go in this book but what I have shown. Money that is due, but not yet received, should not be entered until it is received, and money that is to be paid should not be entered until it is paid, and one year should be kept distinctly separate from another year and not overlapped or run into each other. When one page is full, it and the opposite page should be totalled and the totals carried over to the next pages ahead. The Treasurer should give a receipt for his salary as much as any other person receiving money. Entries should never be made in any book of public record in pencil. Some care should be taken to keep records, in

cash book at least, a little neatly. Every meeting should be recorded in the minute book, and entered one after the other in the order in which they are held, should contain all the resolutions passed or not passed, and should be signed by the Chairman and Secretary-Treasurer.

It is very little credit to the educational system of our Province and the age we live in, to see the indifferent way everything in connection with the records generally is attended to. There are so very few altogether to be made for the whole year that anyone assuming the duties and salary of a Secretary-Treasurer, should take a little pride in trying to keep the records neatly and intelligibly. Very little extra time is required to do a thing well to that required to do a thing badly, and surely the self satisfaction to anyone in knowing that his work is properly done is worth the very little extra labor. Trustees appear to give little attention to seeing proper books are provided and records are properly kept, as evidenced generally in nearly all the records I have examined. The officials cannot do their work unless they are provided with proper books; cheeseparing economy is a poor policy in public records. Better books should be provided, a Cash Book and a Minute Book should always be in use and they should be separate books. These books need rarely cost more than one dollar each, and can be made to last for years. An expenditure of twenty cents per annum for books for the Secretary-Treasurer to properly record his transactions with the public money is surely one that any Board would and should sanction.

Local auditors as a rule seem to have only one idea for guidance—see if the cash corresponds with the entries in the Cash Book. Whether the entries are right they do not seem to know or care, the most glaring inefficiency in making these entries, the absence of any kind of document to vouch for the entry, does not appear to trouble them, the presence or absence of orders, vouchers, system or lack of it all appear to go the same way. Surely people assuming the very responsible position of certifying to the accuracy of another's work ought to see that everything that should be done is done, and if they find it otherwise say so, suggest improvements if they think they are required, make note of anything they think will assist or forward the proper handling of the people's money, not simply say the cash is right, when from the records as they appear in many cases it requires an extremely elastic conscience in my opinion to say so.

In most cases the money appears to be drawn from the Township as soon as it is due and deposited in a savings account in a chartered bank, the school section then benefits by the interest earned as well as the safe custody of the funds. Some of the books show no record of this, however, and I would suggest that Trustees instruct their Treasurer to remedy this. Insurance on the buildings and contents appears to be kept up.

As instances of delinquencies please note:—

In one case Township Treasurer's entry reads $11.20, School books show $10.20, receipts for 1906. No vouchers for 1904 produced, no minute book produced, no orders for payments made by Treasurer. The seal of the school section was impressed on all the 1905 vouchers that were produced, apparently to take the place of an order; no vouchers for 1907 produced.

In another case, a new cash book is very badly needed and should be procured and put in use forthwith; the one now in use is a quaint specimen and is very confusing, no vouchers produced except for 1909, and only some of them forthcoming. The minutes vouch for most of the payments and are generally recorded in pencil, more or less obliterated by time and rough handling. The practice of entering everything in the shape of a payment for expenses—janitor's salary, teacher's salary

—in one sum at the end of the year is a bad one, and should be discontinued. Payments should be entered as they are made.

Another school, no vouchers for 1904 and 1909. Treasurer states he never received 1904 vouchers from former Treasurer and had mislaid those for 1909. The books are badly balanced, the cash is not always entered in the year in which the Township books show it was paid, no orders for payments, many entries are made in pencil, Township books show $34.00 paid and the school books show $15.15 and $15.15 amongst 1907 receipts and the balance of the $34.00 in the 1908 receipts. The minute book is not well entered up, recording very few meetings but the annual one of each year.

Another school, the books are well kept and cheques for all payments produced. The minute book generally records all meetings, resolutions for payment of all bills, accounts, etc. I would suggest that the Trustees obtain a new cash book with the ordinary double column ruling on both pages, and that one of these columns on both debit and credit sides be used for continuation classes only, the other column for the general classes, and that totals be carried forward instead of the difference. This would be easier to keep and easier to check than the present system. Further cash book and ledger do not work harmoniously when both are contained in the same book.

In contrast, the books of another school section are in a deplorable condition; loose memoranda in pencil comprise the attempts made to keep the records. This condition of affairs should be very promptly altered and the Trustees should obtain a cash book and minute book without delay, and have steps taken to put on record for 1910, at least, the receiving and disbursing of the public money committed to their charge, and to have proper minutes kept of their meetings.

Another school, no vouchers for 1904, no minute book introduced. The orders were in most cases attached to the receipts. The one book, apparently the only book, in use is not at all creditable to a rich municipality like the Township of Tilbury West. A new cash book should be procured at once, and put in use. A minute book should also be obtained and used, and the two books should be kept for their own purposes.

In another case, there is a receipt signed by the caretaker on December 22nd, 1908, for $13.00. Entry for this reads, $12.50. The vouchers are fairly complete and well taken care of. There are very few orders to the Treasurer for payments, some years not any, The minutes and cash records are in the same book and very much mixed up with each other. There appears to have been only one meeting recorded each year, the annual one. The balance of cash on hand at the end of each year confuses with the receipts of the following year. As an example:

Township books and vouchers read—

1904	1905	1906	1907	1908	1909
$150 18	$179 78	$121 88			
6 70	3 10	13 55	nothing	$182 11	$148 94
		135 00			
		6 00			

School Section's books read:—

1904	1905	1906	1907	1908	1909
$179 78	$3 10	$13 55	$6 00	$148 94	$156 17
6 70	121 88	135 00	182 11		

Another school, the books are in very poor condition. There are no vouchers. The receipts for salaries paid to the teachers are written by the teachers (apparently) themselves here and there through the cash book. Teacher's receipts, record of meetings, receipts and expenditures are jumbled together without any order through the pages of the one book used for everything. The Secretary-Treasurer informed me he did not take receipts from anyone but the teachers, and when a bill was due he just paid it without either order to do so or receipt for having done so. A very loose condition of affairs appears to exist. As a sample, I may mention:—

Township books and vouchers read—

1904	1905	1908
$100 45	$13 30	$23 20
131 54		

School Section's books read—

1904	1905	1910
$100 00	$14 35	$23 20
131 50		

The trustees should obtain two books forthwith, use one as a cash book the other as a minute book, and instruct their Treasurer to obtain receipts from all persons he pays public money to.

There are no separate schools situated in the Township of Tilbury West. The four schools shown in all the statements are situated in other townships, in union with Tilbury West. Their books, therefore, did not come within the scope of this audit.

In answer to certain statements contained in the petition praying for the special audit, I would beg to say: Mr. F. H. McPherson, having reported that in his judgment and from data at his disposal the Treasurer owed the Township $9,459.57, the Treasurer in office in 1904, T. Beattie, deposited in the bank to the credit of the Township $9,459.57 as security for such amount as should finally be found, or agreed upon, as owing by him. The Treasurer prepared and submitted an itemized statement to the Council showing that he was not indebted to the Township to the amount shown in the Provincial Auditor's Report. The matter was very fully gone into before the public at an open meeting, and the Council upon going into the accounts, and in view of that statement, decided that the Treasurer was overcharged, and that a refund of a part of the amount deposited was due to him. Under the authority of a By-law No. 112 of December 12th, 1904, prepared by Clarke, Bartlett and Bartlett, the Township solicitors, a cheque for $4,835.28 was drawn in favor of T. Beattie and the subject was closed. See cash statement for 1904, which shows both of these transactions.

By an agreement bearing date March 11th, 1905, and a By-law No. 116 of same date, both documents being prepared by J. H. Rodd, the Township solicitor, the Council of 1905 released T. Beattie of all and sundry and office as Treasurer absolutely, and I am unable to trace that there was any need of a special audit in connection with the transfer of office between the outgoing Treasurer, T. Beattie, and the incoming Treasurer, W. A. Keith, who has held the office of Treasurer from March, 1905, to date.

The cash statements for 1904 to 1909 show what has been collected from other townships for amounts owing Tilbury West. A statement attached to the balance sheet shows how the Township of Mersea and this Township stand, and copies of official letters from the Townships of Rochester, Romney, Mersea and Tilbury North would appear to answer the question regarding settlement with other townships.

The report of the special audit showed the Clerk, S. T. Anderson, as indebted to various persons for various refunds, etc., in all amounting to $705.81. This matter was also brought before the Council in open meeting and very fully gone into, and by an agreement dated December 12th, 1904, and a By-law No. 112 of same date, both documents prepared by Clarke, Bartlett and Bartlett, the Township solicitors, the Council released the Clerk from all and sundry, except such claims as would be established against him.

In November, 1904, before Judge McHugh, in the Division Court at Comber, A. C. Hastie sued the Clerk for an amount claimed due as a refund. It was proved to the satisfaction of the Court, who dismissed the case with costs against the defendant Hastie, that the amount sued for had been paid. This was a test case, and I have learned that some of the witnesses and contributors in this case stated to the Clerk and others that they now remembered getting full payment. The Clerk of Tilbury North, I learn, has stated and is still prepared to state that numerous ratepayers of Tilbury North and Tilbury West admitted to him they had been mistaken in making a claim, as they had received all that was due them.

It appears from a number of statements I have gathered from different sources, that in no case was there a good ground for any of these claims, ratepayers apparently being in supposition that they had been assessed for certain drains, which upon investigation proved erroneous. Several parties came before the Council claiming refunds, but when the claim was investigated it was satisfactorily proved that the claimants had not been assessed; therefore, their claim could not be entertained. These and the case in court are the only claims that have ever been made since the Auditor's report was published in 1904, and the above explanation would appear to prove they were not at all well grounded.

The Provincial Auditor's report states that some of the refunds were not paid to the lands assessed at the time of the distribution. The explanation of this is: These lands were owned by corporations and were always in arrears and appeals; the Council considered that the new purchasers would have all the arrears to pay, and were therefore, entitled to any benefit accruing to the lands. So the refunds were withheld from the corporations and afterwards fully paid to the new purchasers, private individuals. This is bad law, but possibly better equity, and it was the order of the Council in each case.

The Clerk has a bill against the Township for $143.00, extra services in connection with the last Provincial Audit. The Council has never come to a settlement with him. He holds in his hands now $40.13 of the Township's money. (See Provincial Auditor's report under his remarks "Refunds on Drains"), which he is prepared to hand over at any moment the Council will come to a settlement with him. In view of the matter being in dispute, I have not considered the question of interest on either sums, but this is a matter that should not be allowed to go any further, and some arrangement should be come to at once.

The cash statement for 1904 shows that a refund was received from the engineer, overpaid on certain awards.

This I think answers all the statements made on the petition praying for a special audit.

Suggestions.

1. The Treasurer presents a monthly statement to the Council of receipts, expenditures and cash on hand. The Council by resolution adopt this report, or statement. I would suggest that the Treasurer present along with this statement his bank pass book balanced to date and a certificate from the bank to the effect that the balance shown in the pass book, is the balance of cash due the Township of Tilbury West then in the bank. This will make the statement valuable. At present it is perfectly valueless. Moreover, the resolution adopting the statement vouched by nothing, if shortages arose would offer a splendid opportunity to contest the liability of the Treasurer's bonds.

2. At present the bank pass book is written up very irregularly, and the vouchers returned by the bank once only for the year. I would suggest that the pass book be given to the bank, to be written up, at least one day of each week, also that all vouchers be returned by the bank once a month, twelve times yearly. The Treasurer could compare his cash book entries with the vouchers and pass book, and any errors detected could be remedied at once, instead of waiting a year as is the practice at present.

In conversation with the manager of the bank in which the Township account is kept, the manager informed me he would be pleased to see the above suggestions carried out, and would certify to the balance and deliver the vouchers monthly, much in preference to the method at present in practice.

3. There is an excellent safe in the Treasurer's office, the townships' property. It requires a bar in the handle throwing the bolts, and the plate on the inside of the door straightened. A blacksmith could easily do both of them. It also requires a lock. The twirler on the combination is in its place but the lock is not, this should be attended to. There is a good vault inside the safe, with a combination lock in apparent good order. The vault should be used for the safe-keeping of vouchers, etc. All the books of the Treasurer will pack into the safe and should be kept there, not lying around the office as at present. The bar put in the handle and the door-plate straightened would render the safe fire-proof, even without a lock. I would suggest this being done and the safe put in use at once.

4. No cheque should be issued to a school section without a proper requisition properly signed. The cheques should always be numbered consecutively, the stub filled in to correspond with the cheque. The cheques should be drawn in ink, never in pencil. Cheques should never be drawn payable to bearer. The cheque-book should not be used for any other purpose. The number and date of cheque should be endorsed on the requisition, the requisition being carefully filed as a voucher. The number of the cheque should always be put in the voucher column in the cash book.

5. There is a large stock of official receipt books on hand and the Treasurer should use them. Nothing should be received that a receipt is required for, without one of those receipts being used. No receipt of money, however small, or trifling should be omitted to be vouched for by an official receipt. The stub of the book should be filled in to correspond with the receipt issued. At present it is only by hunting up in the bank pass book, and in some cases adding several items together that it is possible to surmise the accuracy of the cash book entry.

6. Care should be taken to see that the treasurer's official stamp is impressed on all cheques issued by the Township Council, and greater care should be taken of the stamp itself.

7. More care and time should be expended on the entries made in the books of account; dates: year, month, day, should always be inserted. Totals should be made with great care, and not inserted until they are proved correct. The Journal should be used for passing and recording transactions that are not cash, and in making any entry in any book full explanation of what it is should always be inserted. This full explanation in almost every case only takes a few seconds extra, and saves hours' of worry in trying to trace out the transaction afterwards.

8. The Treasurer should pay more attention to getting warrants entered under their proper heads in the cash book, and posted to the proper account in the ledger. A little communion with the Clerk would ensure this. The Clerk may make a mistake and draw the warrant under a wrong head, and does occasionally. The Treasurer blindly following charges it wrongly and confusion results.

9. Blank coupons should be cut off the debentures issued and carefully preserved. It is clumsy looking to see a debenture with a host of blank coupons attached to it. It is also paving the way for a fraudulent use being made of them.

10. Care should be taken to keep the debenture register in accordance with its headings, and the issue of the debentures. The entries in the register should be made in ink, and in posting receipts and payments, cash book and ledger pages should be entered in the register, and register pages should be entered in cash book and ledger.

11. Full amount of Pound-keeper, Town-Hall Janitor, or any similar account should appear on the debit side of the cash book, and the deductions on the credit side of the cash book, not the difference. In almost every case I find the above accounts wrongly entered.

12. An account should be opened for interest and exchange debited with interest received from all sources, and credited with interest paid and exchange paid. The cash book should show what cheques the exchange is paid on, and an arrangement might be entered into with the bank to have the face of the cheque credited, and the exchange debited in the pass book. An account should be opened for "Awards," as transactions under the Ditches and Watercourses Act are headed in the Rolls, debited with all payments from the cash book, and credited with the levy. Full explanation of each entry in cash book, ledger and journal will result in any omission, overpayment or over-charge being immediately detected. The account at present in the ledger is not a very good one.

An account should be kept for insurance premiums, for Town Hall insurance, and official's bonds should appear in it.

An account should be opened for the lately acquired Gravel Pit, and another for the Town Hall. They should be kept about alike, debiting with all costs, and crediting with revenue produced. As far as I can make it, the Town Hall was in debit at the beginning of the year $2,745.42, and the Gravel Pit $883.15. These accounts should be opened now, by passing a journal entry crediting the general fund and debiting the accounts as above, then keep them going on for all time, showing what they are costing and what they are producing.

13. Each drain construction with a debenture issue involves the opening of three ledger accounts. When the by-law passes, an account should be opened for that drain and that work only—do not mix them up with others—pass a journal entry crediting the drain with the debenture issue and debiting a debenture issue account with the amount to be raised, when the debentures are sold. Credit from the cash book an account showing who to and what for you owe the money. As each levy is made credit the debenture issue account with the amount charged on the Roll; as each payment is made of principal and interest pass a journal entry

for the interest, debiting the debenture issue account and crediting the debenture debt account. Post the payment from the cash book to the debit of the debenture debt account. Should any person pay his assessment minus interest before the debenture issue, as is frequently the case, post that receipt from the cash book to the credit of the drain account and pass a journal entry debiting the general fund and crediting the drain, with the interest that would have been collected had the payment not been made in advance. The general fund getting the benefit of the advance payment should bear the loss of the interest. Should any other township contribute, the drain account would be credited with that contribution from the cash book. Should the debentures sell at a premium the general fund receives the benefit. Should they sell at a discount the general fund must bear the loss. You will observe the debenture issue account will show on the debit side the whole debenture debt and the yearly interest, on the credit side the amount raised yearly to pay it. At the expiration of the term the special rate is levied both sides should exactly balance. The debenture debt account will show on the credit side the amount of the loan and what it is costing yearly, and on the debit side how much of the principal and interest is paid. At the end of the period the loan has to run, if payments are properly posted, both sides should balance even.

The drain account will show on the credit side what money there is to expend and on the debit side what money has been expended. At the end of construction if the drain has a debit balance, the cost has exceeded the estimation and a supplementary by-law will be in order to raise the money to pay that excess, if it has a credit balance the estimate has exceeded the cost, and a by-law is necessary to refund the over-assessment. If a supplementary by-law has to pass it should be treated in all the books precisely as an original by-law would be, but if a refund by-law is necessary the journal entry would debit the drain and credit a refund account, to the debit of which new account all payments from the cash book would be posted. Do not forget the general fund would require to be credited with its proportion of the refund and the refund account debited. This would require a journal entry. When all the refunds have been made this would balance even.

You have a number of partly paid debentures now in the books and I would suggest accounts being opened for them, following the above lines as nearly as the circumstances will admit.

14. The duty of preparing and afterwards copying the various by-laws required to be issued is a very laborious and lengthy one, I have planned a system of filing the original by-law in a guard book, opened communication with a firm of bookbinders to make suitable books, and explained to the Clerk how they should be used (with the concurrence of the Council). They will be filed in order of number, indexed, and so avoid the labor of copying into a by-law book, which at present is much neglected, and the present system of merely folding and placing in a drawer is neither a very safe nor handy one.

15. The tax collector has been completing his records in a very perfunctory manner. By an arrangement the Northern Crown Bank receives taxes instead of the collector, these receipts are entered in a pass-book by the bank for the collector, also in the Township's pass book, the tax demand is marked "Paid" by the bank and returned to the tax payer. The collector has not been in the habit of entering on his roll, date of demand, date of payment, struck off by Council, or certificate on returning roll. I have planned a demand for taxes with a coupon attached corresponding to the demand; the bank receiving the taxes have agreed to take off this coupon, mark it "Paid" at the same time as they do the demand, and after using it themselves return it to the collector;

it will then become a voucher for the collector to use in entering the payments in his book, record in the roll and then become a voucher to the treasurer. I have also shown the collector how to enter the date of demand, date of payment, etc., in the roll, and have suggested that a supply of certificates be obtained by the Clerk, one of which be filled in, sworn to, and affixed to the roll when the roll is returned (all this with the concurrence of the Council).

16. The accounts of the Police Village of Comber are not in a satisfactory condition. They have always kept their one account with the township, they have a separate minute book, and a separate cheque book, the separate cheque is signed by the Inspecting Trustee and the bank pays them out of the township account, the township treasurer records these payments on the credit side of the township cash book in one separate column, he keeps one account in the ledger for the village, crediting it with the levy and some small miscellaneous receipts, and debiting it from the column in the township cash book, there is no distinction observed in the bank account, and as the village has several times borrowed money on promissory notes, which they discount and sometimes renew, the anomaly appears of discounts, renewals and renewal charges in an account with a large credit balance. I would suggest that a separate cash book and ledger be kept, and that they keep separate accounts of each class of their expenditure which would entail little or no extra work on the treasurer and be much more satisfactory.

17. It would be much more satisfactory and more in accordance with the Act, if the commutated statute labor were credited to each division it is charged against and a separate account for each division opened in the ledger, crediting each division with the amount collected and debiting it with the money paid to each pathmaster, and a detailed statement insisted upon from every pathmaster receiving commutation.

18. If the by-law striking the rates embodied the amount to be raised for each purpose, township, road drainage, general school, etc., a better estimate and a closer rate could be obtained. The practice in vogue at present admits of a very wide range and is never very accurate.

19. The statute labor regulation for the Police Village of Comber applies to all property within the village limits, and under the authority of an ancient by-law is as follows:

Property assessed up to $100,00, 1 day at 75 cents.
Property assessed over $100.00 and up to $1,000.00, 2 days at 75 cents.
Property assessed over $1,000.00 and up to $1,200.00, 3 days at 75 cents.
Property assessed over $1,200.00 and up to $1,600.00, 4 days at 75 cents.
And for every additional $1,000.00 assessment or the largest part thereof an additional 1 day at 75 cents.

A large number of the village assessments range at $100.00, $200.00, $300.00, and $400.00.

I am perfectly well aware that this does not come within my scope, but I trust the village authorities will accept my suggestion and amend that part of the by-law relating to the part affecting property assessed from $100.00 up to $1,000.00, and make it read on all property assessed up to $400.00, 1 day at 75 cents.

It appears a little unfair that a property assessed at $125.00 and another assessed at $1,000.00 are equal in the statute labor tax.

The Township Officials, Reeve and Councillors, who have been called upon for information and other assistance in connection with this examination and audit, have complied with the utmost cheerfulness and willingness, for which I desire to express my obligations; also the Manager of the Northern Crown Bank, to whom I am obliged for his readiness to meet me in a few improvements suggested.

All matters of enquiry have been dealt with as fully as possible. The result of the audit is now respectfully submitted.

W. J. Ross,

Chartered Accountant.

Barrie, Nov. 8, 1910.

Statement showing amounts charged and recovered from lands for the years 1904 to 1909, both inclusive, Special Drainage Assessment.

Name of Drain.	By-law.	Date.	Annual payment	No. years.	Charged on lands in rolls of						Total charged on lands.	Amount due as per By-law.	To be refunded on 1910 taxes.	To be charged on 1910. taxes.
					1904	1905	1906	1907	1908	1909				
			$ c.		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Plouffe	147	1907	68 56	5	.....	.....	.....	68 56	68 56	68 56	205 68	205 68	.....	.....
Hyatt	151	1908	69 51	5	.....	.....	.....	.....	69 51	69 51	139 02	139 02	.....	.....
Kinsman	145	1907	130 74	5	.....	.....	.....	130 74	130 74	130 74	392 22	392 22	.....	.....
18 and 19 side road	136	1906	150 62	5	.....	.....	150 62	150 62	150 62	150 62	602 48	602 48	.....	.....
West Town Line	132	1906	225 91	5	.....	.....	224 91	225 91	225 91	225 91	902 64	903 64	.....	1 00
Jones	89	1903	87 77	5	87 77	87 77	87 77	87 77	.....	.....	351 08	351 08	.....	.....
Malden Road East	134	1906	129 65	5	.....	.....	129 65	129 65	129 65	129 65	518 60	518 60	.....	.....
Malden Road Outlet	135	1906	210 88	5	.....	.....	210 88	210 88	209 72	229 93	861 41	843 52	See statement.	2 32
Alexander	68	1900	564 08	5	471 66	.....	.....	.....	.....	.....	471 66	564 08	See statement.	53 73
Ruscomb	91	1903	126 38	5	125 99	125 72	125 23	125 59	.....	.....	502 53	505 52	.....	2 99
No. 1 Government	93	1903	101 99	5	101 99	101 99	101 99	101 99	.....	.....	407 96	407 96	.....	.....
No. 2 Government	126	1905	191 42	5	.....	188 72	191 42	191 42	191 42	191 42	954 40	957 10	07	2 77
No. 3 Government	146	1907	272 89	5	.....	.....	.....	270 59	275 21	272 84	818 64	818 67	.....	05
Old Government	40	1896	975 31	10	975 47	975 11	.....	.....	.....	.....	1,954 58	1,950 62	3 96	.....
No. 2 Government Supplementary	127	1905	34 19	5	.....	33 68	34 19	34 19	34 19	34 19	170 44	170 95	.....	51
Little Creek	82	1901	430 86	5	430 86	430 86	.....	.....	.....	.....	861 72	861 72	.....	.....
Little Creek	109	1904	267 51	5	.....	262 89	262 89	262 89	262 89	244 41	1,295 97	1,337 55	See statement.	18 48
Robb-Dales	104	1904	450 54	5	450 54	450 44	450 54	433 15	461 34	.....	2,246 01	2,252 70	10 80	17 49
Robb-Dales Bridge	154	1908	91 42	2	.....	.....	.....	.....	.....	94 10	94 10	91 42	2 68	.....
6 and 7 Side Road	133	1906	114 08	5	.....	.....	107 73	113 62	116 37	114 31	452 03	456 32	2 52	6 81
6 and 7 Side Road Supplementary	155	1908	241 39	1	.....	.....	.....	.....	234 06	.....	234 06	241 39	.....	7 33
Turnbull	64	1899	185 29	5	185 29	.....	.....	.....	.....	.....	185 29	185 29	.....	.....
Turnbull	94	1903	559 46	5	559 46	559 46	559 78	559 46	.....	.....	2,238 16	2,237 84	35	03
Turnbull Bridge	153	1908	45 50	5	.....	.....	.....	.....	45 78	45 78	91 56	91 00	See statement.	.....
Turnbull Supplementary	152	1908	577 83	1	.....	.....	.....	.....	577 83	.....	577 83	577 83	.....	.....
7th Concession extension	129	1906	163 95	1	.....	.....	163 95	.....	.....	.....	163 95	163 95	.....	.....
Big Creek	45	1897	1,490 95	10	1,490 62	1,490 97	1,491 47	.....	.....	.....	4,473 06	4,473 85	See statement.	.....
No. 1 Government	97	1903	516 21	5	509 97	516 91	516 04	479 28	.....	.....	2,022 20	2,064 84	4 57	47 21
No. 4 Government	46	1897	158 15	10	158 15	158 15	158 15	158 12	.....	.....	632 57	632 60	.....	03
					5,547 77	5,386 67	4,967 21	3,734 43	3,183 80	2,001 97	24,821 85	24,998 44	.....	.....

Statement of amounts to be charged on roads (General Road Drainage) for the years 1904 to 1909, both inclusive.

Name of Drains.	By-law.	Date.	No. years.	To be charged on Rolls of						Total.
				1904	1905	1906	1907	1908	1909	
				$.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Plouffe	147	1907	5	.....	.....	.....	3 81	3 81	3 81	11 43
Hyatt	151	1908	5	.....	.....	.....	.....	21 60	21 60	43 20
Kinsman	145	1907	5	.....	.....	.....	9 00	9 00	9 00	27 00
18 and 19 Side Road	136	1906	5	.....	.....	65 00	65 00	65 00	65 00	260 00
West Town Line	132	1906	5	.....	.....	110 64	110 64	110 64	110 64	442 56
Jones	89	1903	5	21 02	21 02	21 02	21 02	.....	.....	84 08
Malden Road East	134	1906	5	.....	.....	47 05	47 05	47 05	47 05	188 20
Malden Road Outlet	135	1906	5	.....	.....	31 18	31 18	31 18	31 18	124 72
Alexander	68	1900	5	106 73	.....	.....	.....	.....	.....	106 73
Ruscomb	91	1903	5	30 03	30 03	30 03	30 03	.....	.....	120 12
No. 1 Government	93	1903	5	7 72	7 72	7 72	7 72	.....	.....	30 88
No. 2 Government	126	1905	5	.....	59 41	59 41	59 41	59 41	59 41	297 05
No. 3 Government	146	1907	5	.....	.....	.....	53 01	53 01	53 01	159 03
Old Government	40	1896	10	196 29	196 29	.....	.....	.....	.....	392 58
No. 2 Government Supplementary	127	1905	5	.....	10 62	10 62	10 62	10 62	10 62	53 10
Little Creek	82	1901	5	31 89	31 89	.....	.....	.....	.....	63 78
Little Creek	109	1904	5	.....	31 37	31 37	31 37	31 37	31 37	156 85
Robb-Dales	104	1904	5	70 08	70 08	70 08	70 08	70 08	.....	350 40
Robb-Dales Bridge	154	1908	2	.....	.....	.....	.....	.....	137 14	137 14
6 and 7 Side Road	133	1906	5	.....	.....	53 01	53 01	53 01	53 01	212 04
6 and 7 Side Road Supplementary	155	1908	1	.....	.....	.....	.....	112 15	.....	112 15
Turnbull	64	1899	5	17 15	.....	.....	.....	.....	.....	17 15
Turnbull	94	1903	5	124 69	124 69	124 69	124 69	.....	.....	498 76
Turnbull Bridge	153	1908	5	.....	.....	.....	.....	10 17	10 17	20 34
Turnbull Supplementary	152	1908	1	.....	.....	.....	.....	128 29	.....	128 89
7th Concession Extension	129	1906	1	.....	.....	36 05	.....	.....	.....	36 05
Big Creek	45	1897	10	255 73	255 73	255 73	.....	.....	.....	767 19
No. 1 Government	97	1903	5	120 13	120 13	120 13	120 13	.....	.....	480 52
No. 4 Government	46	1897	10	36 83	36 83	36 83	36 83	.....	.....	147 32
Totals	.....	.....	.....	1,018 29	995 81	1,110 56	884 60	816 99	643 01	5,469 26
Charged and recovered on Rolls	.....	.....	.....	1,356 55	1,057 61	1,130 83	1,412 58	1,836 40	1,856 32	8,650 29
Surplus	.....	.....	.....	338 26	61 80	20 27	527 98	1,019 41	1,213 31	3,181 03

NUMBER ON ROLL AND AMOUNTS CHARGED ON 1910 ROLL, FOR SHORTAGE AS PER PROVINCIAL AUDIT.

Police Village of Comber.		Commutation of Statute Labor.		Drains.		Drains.		Drains.	
No. on Roll.	Amount.	No. on Roll.	Amount.	No. on Roll.	Amount.	No. on Roll.	Amount.	No. on Roll.	Amount.
	$ c.		$ c.		$ c.		$ c.		$ c.
403	10	631	1 00	216	6 21	For'd.	87 64	For'd.	108 39
452	3 18	632	2 00	217	11 18	596	1 50	254	23
482	7 44	633	2 00	103	10	528	2 77	N. Res. 3	23
524	6 07	634	2 00	620	18 48	602	34	244	23
440	4 06	267	2 00	634	51	592	1 04	243	23
502	68	265	3 00	634	2 77	524	69	243	23
419	4 06	272	4 00	7	1 00	594	1 85	243	23
485	4 06	244	2 00	N.R. 1	2 32	592	2 20	243	1 84
419	6 33	253	1 00	367	7 33	592	1 85	243	46
	35 98	631	50	24	6 35	253	23	257	46
		632	50	472	23	263	23		112 53
		274	2 00	453	23	279	46		
		243	1 00	602	34	271	69		
Staples. Side Walk.		254	1 00	01	1 85	267	23		
		274	2 00	02	1 85	261	23		
		159	4 00	03	2 19	407	34		
243	11	631	50	419	35	462	35		
	—	632	25	507	34	419	35		
		633	3 00	261	23	519	53	Recapitulation.	
Awards.		634	2 00	266	46	439	1 85		
		257	2 00	260	46	457	99		$ c.
360	5 15	261	2 00	573	03	243	26		
316	8 00	159	4 00	196	05	253	02	Comber.....	35 98
299	2 50	209	2 00	464	35	251	08		
254	4 50			429	80	251	04	Staples.....	11
265	4 50		45 75	485	32	243	22		
253	2 00			508	1 50	274	08	Awards	70 15
549	42 50			511	1 84	243	12		
N.R. 1	1 00			513	3 69	243	16	Statute Labor	45 75
				519	35	253	07		
	70 15			515	2 19	243	16	Drains	112 3
				516	1 85	265	03		
				517	1 84	274	16		264 52
				519	8 05	457	58		
						N. Res. 2	02		
						304	03	The whole of this is to be credited to the General Fund.	
			Carried for	ward	87 64	For'd.	108 39		

POLICE VILLAGE OF COMBER.

By-Law 11: $6.19 was refunded to A. J. Brown for overcharge on English Church property, see page 113, Cash Book of 1906, under heading P.V. This Assessment, total $40.21, was paid to the treasurer before the debentures were issued, which makes $6.19 short on each payment, as per Assessment total.

Page 30, No. 523 Roll 1907, Crown Bank to be charged $3.18. Omitted on 1909 Roll.

Catherine Story was refunded $6.01. See warrant No. 801 of February 12, 1910. Charged in error.

John Ford paid to the treasurer $6.01, see Cash Book, page 78 of February 12, 1910. Undercharged in error.

Part Village Lots $30.31, on 7, Ford Street East, to be charged $7.44, omitted on 1909 Roll.

By-Law 10: $5.91 M.C.R.R. Assessment. $7.36 M.C.R.R Assessment. By an agreement entered into by the Village Trustees with the M.C.R.R. under date of February 16 and April 16, 1909, and confirmed by a resolution of the trustees, February 18, 1909, the M.C.R.R. supplied gravel and cinders to build up the foundations for the Silex Walks on both sides of the R.R. track on Main Street, equivalent in value to this Assessment $66.35 total for both By-Laws free of charge to the village, which makes By-Law 10 $7.36 short on each assessment charged. And By-Law 11, short $5.91 on each assessment charged. These assessments having been pro-rated on the supposition that the M.C.R.R. would pay their assessments and the Police Village pay for the material. Under the agreement made between the ratepayers and the Police Village, the ratepayers paid 60 per cent. and the Police Village paid 40 per cent. of all costs of Side Walks construction, excepting the street crossings, which are paid for entirely by the Police Village, there is now a refund due to the ratepayers assessed under By-Laws 10 and 11 of 60 per cent. of the sum of $66.35 or $39.81, being the total amount of the M.C.R.R. Assessment which should be pro-rated and refunded by the Police Village on the 1910 taxes.

Village Lots 2 and 3 on 7, to be charged $6.07. Omitted on 1907 Roll. Lot 3 was not assessed in 1907.

Village Lot 20 on 7 to be charged $4.06. Omitted on 1908 Roll. This lot was not assessed in 1908.

Methodist Parsonage to be charged 68 cents. Omitted on 1908 Roll.

Village Lot 8 on 7 to be charged $4.06.

Village Lot 8 on 7 to be charged $4.06. Different survey.

Village Lot 7 on 7 to be charged $6.33. Main East. Omitted on 1908 Roll. These lots were not assessed in 1908.

Village Lot 23, Taylor Avenue, N. G. Ainslie, $3.74, was omitted on 1906 Roll and was charged double on 1907 Roll to rectify the omission.

The special rate shown in 1906 was the charge for crossings, and was not included in the General Rate for 1906, and was only collected specially in 1906. Other years this charge was included in General Rate.

Village of Staples,

By-Law 165: Village Lot 13 on West Part 1, Concession 11. W. Alexander to be charged 11 cents., error in 1909 Roll.

Awards.

Collector's Roll, 1909.

Page 20. No. 437. M. Part N½ 4, M.R.N. A. Dupuis. By certificate of J. J. Newman, C.E., dated January 16, 1909. This property should have been charged $12,00, but through an error it was only charged $6.85, there is therefore $5.15 to be charged on the 1910 Roll.

Page 7, No. 111, Gores 1, 2, 3, Concession 9, J. S. Ainslie charged $5.00 in Award Column.

Page 7, No. 125, W. part N½ 6, Concession 9, Thos. Jackson charged $4.00 in Award Column.

Both these entries are Commutation Statute Labor, and should have been charged in the next column. Error in entering on roll. The awards are $9.00 over computed, and the Commutation Statute Labor $9.00 under computed in the recapitulation of 1909 Roll.

Page 11, Nos. 203, 204. S.E.¼ Lot 10. Concession 10, Simon Young. By certificate of J. J. Newman, C.E., dated December 11, 1908. This property should be charged $8.00 on 1910 Roll. Omitted on 1909 Roll.

Collector's Roll, 1905.

Page 22. No. 352. E. part N½ 1 M.R.S. Catherine Elliott. Belmore Awards dated July 25, 1905. This property to be charged $1.00 under above award. Omitted on 1905 Roll.

The items on the attached schedule under the heading "Awards," extra to the above, were short charged on 1909 Roll, through the engineer's certificates having been mislaid. In checking the payments to the engineer it was discovered they had not been charged. Copies were obtained and the amounts charged as per the schedule attached.

PATHMASTER'S LISTS AND COMMUTATION OF STATUTE LABOR.

Collector's Roll, 1905.

M. C. R.R. should be charged $2.00, L. & St. C. R.R. should be charged $2.00, G. N. W. Telegraph Co. should be charged $2.00, and the Bell Telephone Co. should be charged $1.00, and recovered on 1910 roll. These were all omitted in 1905 Roll.

Collector's Roll, 1906.

Lot 8 on 1, Concession 11. Widow Doust, $2.00, which should have been charged on the Roll, was allowed her by the Council on a charitable basis. There is no record that I can find of this allowance. It would be better, when a similar case arises, to charge it and then refund it, and a record would then be on file. The refund could be charged to " Charity " in the accounts, which of course it is.

Part S.E. ¾ of 1, Concession 11, List No. 1. D. Alexander was not returned in time to charge on 1908 Roll and party was absent in 1907. This is lost to the township, $2.00.

Lots 6 and 16 on 2, Concession 11. W. Manly, $2.00. Omitted on 1906 Roll. Should be charged on 1910 Roll.

Lots 15 on 2, Concession 11. F. McDonald should be charged $2.00 for 1906 and $1.00 for 1907. Omitted from Rolls. Should be charged on 1910 Roll.

Part of 2, Concession 11. Joseph Bogrand should be charged $4.00 on 1910 Roll.

Collector's Roll, 1907.

Lots 9, 10 on 1, Concession 11. Geo. Moore, $1.00. Should have been charged, but the list not being returned until after the Roll was issued, the charge could not be made. Before 1908 he was gone and the sum is lost.

Lots 3, 4, 5, 7 on 1, Concession 11. Rev. J. W. Campeau should be charged $2.00 on 1910 Roll.

Part S.E. ½ 1, Concession 11. W. H. Travis should be charged $1.00 (balance of 1907 Statute Labor) on 1910 Roll.

Bell Telephone Co. should be charged 50 cents on 1910 Roll.

G. N. W. Telegraph Co. should be charged 50 cents on 1910 Roll.

Part 2, Concession 11. D. Boyd should have been charged $1.00, but the list not being returned in time, and next year having left, this amount is lost to the township.

20 on 1, Concession 11. W. McLennan should be charged $2.00 on 1910 Roll.

9 on 2, Concession 11. D. A. Black should be charged $2.00 on 1910 Roll.

12 on 1, Concession 11. A. J. Mailloux should be charged $1.00 on 1910 Roll.

9 on 2, Concession 11, D. A. Black should be charged $2.00 on 1910 Roll.

Collector's Roll, 1908.

E. ½ S. ½ Lot 15, Concession 9. D. Strang should be charged $4.00 on 1910 Roll.

Bell Telephone Co. should be charged 50 cents on 1910 Roll.

G. N. W. Telegraph Co. should be charged 25 cents on 1910 Roll.

M. C. R.R. should be charged $3.00 on 1910 Roll.

L. & St. C. R.R. should be charged $2.00 on 1910 Roll.

Collector's Roll, 1909.

Lots 20 to 23 on 1, Concession 11. N. Chauvin should be charged $2.00 on 1910 Roll.

Lots 6, 17, 18, 19 on 2, Concession 11. R. R. Menzies should be charged $2.00 on 1910 Roll.

Lot E. ½ S. ½ 15, Concession 9. D. Strang should be charged $4.00 on 1910 Roll.

N.W. corner 13, Concession 10. Orange Hall should be charged $2.00 on 1910 Roll.

N. ½ 2, M. R. N. J. Lebert should be charged $6.00 on 1910 Roll.

W. part N. ½ 3, M. R. N. W. Garrant should be charged $3.00 on 1910 Roll.

E. part N. ½ 3, M. R. N. N. Garrant should be charged $.00 on 1910 Roll.

S. ½ 2, Concession 6. C. Renaud should be charged $6.00 on 1910 Roll.

These are disputed by the parties; they claim they do not owe; the pathmasters claim the above should be charged. This will require investigation by the Township Council.

The Pathmasters Lists are very incomplete, the certificate on back is hardly ever filled in, the number of days performed or due is in a great many cases left unfinished. A pencil notation on the front "Done" is in many cases all they have done. Very few are signed anywhere. Some years fully the half of them are not forthcoming, never having been returned. The majority of omissions mentioned above occur through the list either not being returned at all, or through being returned so long after they were due that the charges could not be entered on the roll, and then they are forgotten on the next roll, and sometimes when they are entered on the following year's roll are vehemently disputed. The Council are urged to take some steps toward having this state of affairs remedied, as money is lost each year to the township by these irregularities.

The Pathmasters have never made any return (that I am able to discover) of the cash paid to them to be expended on their beats. They appear to get the money (and expend it, I suppose), but there does not appear to ever have been

any returns made as to this expenditure. This is very irregular, and the attention of all concerned is drawn to this condition of affairs, with the view to an amendment of it in the future.

DRAINS.

Robb-Dales.

By-Law 104. W½, S½, S½, E½, W½, Lot 15, Concession 10 to be charged $11,18.

W½, N½, E½, N½, Lot 15, Concession 10, to be charged $6.21. Omitted 1907 Roll.

E½ Lot 14, W½ Lot 15, E½ Lot 15, all on Concession 11, to be refunded $3.60 each. Overcharged on 1908 Roll.

See page 22, 1908 Roll, figures transposed.

W½ Lot 15, Concession 8, to be charged 10 cents, undercharged on 1905 Roll.

Little Creek:

By-Law 109. N½ Lot 12, M.R.S., to be charged $18.48. Omitted on 1909 Roll.

N½ 10, M.R.N. Annual Assessment $4.62. The amount in full of this assessment (less 5 years interest) $20.00 was paid to the treasurer before debentures were issued, making an amount of $4.62 short on each annual total payment, or a total of $23.10 including 5 per cent. interest.

No. 2 Government Supplementary:

By-Law 127, 51 cents to be charged to L. & St. C.R.R. Omitted on 1905 Roll.

No. 2 Government:

By-Law 126, $2.77 to be charged to L. & St. C.R.R. Omitted on 1905 Roll.

S. W¼ 6, Concession 9, to be charged 7 cents. Overcharged on 1905 Roll.

West Town Line:

By-Law 132, $1.00 to be charged to E½ Lot 2, Concession 5. Omitted on 1906 Roll.

Malden Road Outlet:

By-Law 135, $1.16 to be charged to E. part N½ 1. M.R.S. Omitted in 1908 and 1909 Non-Resident Roll, $1,16 both years.

$20.21 charged in error on S½ 1 M.R.S. Refunded to A. Roussin on November 13, 1909, see warrant 660 Cash Book, page 67, under heading Drainage Accounts of 1909.

Robb-Dales Bridge:

By-Law 154. Through an error in pro-rating, each property assessed under this by-law has been slightly overcharged, the schedule requires to be re-prorated. (This has been done.)

6 and 7 Side Road Supplementary:

By-Law 155, $7.33 to be charged to N. E. part 5, M.R.N. Omitted on 1908 Roll.

6 and 7 Side Road:

By-Law 133, $6.35 to be charged to S½ S½ 6, Concession 5. Omitted on 1906 Roll.

$2.29 to be refunded to N. E. part 5, M.R.N. Overcharged on 1908 Roll. (Assessment Schedule reads $3.47. Charged on Roll $5.76.) 23 cents to be refunded to Village Lot 46 on 6 M.R.N. Charged on 1909 Roll in error. (This property is not on Assessment Schedule.) Page 29, No. 564, 1908 Roll, to be charged 23 cents. Omitted on 1908 Roll. Page 28, No. 557, 1909 Roll, to be charged 23 cents. Omitted 1909 Roll.

Turnbull Drain Bridge:

By-Law 153, in pro-rating the total assessment the ½ cent in each case was charged on 1908 and 1909 Rolls. By refunding 1 cent on all property assessed each second year this will balance.

No. 1 *Government*:

By-Law 97, Village Lot 31, M.R.S. plan 383, to be charged 34 cents. (Catherine Taylor.)

Village Lot 6 on 7 M.R.N. to be charged $1.85. (Methodist Church.)

Village Lot 7 on 7 M.R.N. to be charged 35 cents. (J. Buchanan.)

Not assessed for general taxes.

Village Lot 60 on 6, M.R.N., to be charged $1.85. (Presbyterian Church.)

Village Lot 26 on 6, M.R.N., to be charged 34 cents. (C. House.)

Village Lots 45, 46 on 6, M.R.N., to be charged $2.19. (English Church.)

All these omitted on 1904 Roll.

Village Lot 67 to 70 on 7, M.R.N., to be refunded 70 cents (Mann Estate). Overcharged on Roll of 1905.

Village Lots 28 to 33 on 7, M.R.S., to be refunded 67 cents (John White, Jr.). Overcharged on 1906 Roll.

Village Lot 48 on 6, M.R.N., to be refunded 80 cents (J. S. Ainslie). Overcharged on 1906 Roll.

Village Lot	4	on	7	M.R.N.		to be charged	$1 85
"	" 28	"	6	M.R.N.	(W. Agnew)	"	35
"	" 48	"	6	M.R.N.	(J. S. Ainslie)	"	80
"	" 28	"	7	M.R.N.	(G. Goabe)	"	32
"	" 27, 28	"	7	M.R.N.	(S. Nelson)	"	1 50
"	" 18, 19, 42	"	7	M.R.N.	(John Elliott)	"	5 53
"	" 50	"	7	M.R.N.	(D. Elliott)	"	35
"	" 15, 16	"	7	M.R.N.	(D. Young)	"	2 19
"	" 14	"	7	M.R.N.	(Mrs. E. Marshall	"	1 85
"	" 12	"	7	M.R.N.	(C. E. Knister)	"	1 84
"	" 10, 11	"	7	M.R.N.	(C. L. McDermott)	"	3 70
"	" 45, 46	"	7	M.R.N.	"	"	69
"	" 43, 44	"	7	M.R.N.	"	"	69
"	" 47, 48, 49	"	7	M.R.N.	"	"	1 06
"	" 51, 52, 53, 54	"	7	M.R.N.	"	"	1 38
"	" 72, S. ½ 73	"	7	M.R.N.	"	"	53
"	" 7, 8, 9, 21	"	7	M.R.S.	(Jos. Favor)	"	1 50
"	" 58 to 69	"	7	M.R.N.	(W. Joynt)	"	2 77
"	" 28 to 33	"	7	M.R.S.	(John White, Jr.)	"	34
"	" 9, 15, 16	"	7	M.R.S.	(Coulson Est.)	"	1 04
"	" 2, 3	"	7	M.R.N.	(Mrs. Frankfurth, Sr.)	"	69
"	" 11, 12	"	6	M.R.S.	(Mrs. Whales)	"	1 85
"	" 22	"	7	M.R.S.	(D. McAlister)	"	35
"	" 26	"	7	M.R.S.	"	"	1 85
"	" 16	"	6	M.R.N.	"	"	1 85
"	" S. part 12	"	6	M.R.N.	(J. D. Forbes)	"	34
* "	" S. part 13	"	6	M.R.N.	(R. O. Y. Ainslie)	"	35
"	" 7	"	7	M.R.N.	(J. A. Buchanan)	"	35
"	" N. ½ 73, 74	"	7	M.R.N.	(E. Abbott)	"	53
* "	" 31	"	6	M.R.N.		"	1 85

All omitted on Roll 1907. *Not on Assessment Roll, 1907.

Village Lot 48, 49	on 6 M.R.N.		to be refunded	$0 48
" " N. part 5	" 7 M.R.S.		"	1 84

Overcharged on 1907 Roll.

Ruscomb.—By-law 91, part S. ½ on concession 11, to be charged 29 cents. Omitted on 1904 Roll.

Part of W. part 1,	Concession 11	(W. Alexander)	to be charged	$0 26
Part of S. part 1,	" 11	(W. H. Travis)	"	02
28, 29, 30 on 1	" 11	(D. Alexander)	"	08
Part of S. ½ 2	" 11	(G. W. Ainslie)	"	40

Omitted on 1905 Roll.

27, 28 on 1	" 11	(D. Alexander)	"	04
14, 2, 24 on 1	" 11	(W. Alexander)	"	22
3, 10, 17, 18 on 1	" 11	(T. G. Dunmore)	"	08
Part of S. ½ 2		(G. N. Ainslie)	"	30

Omitted on 1906 Roll.

2, 4, 8, 12, 13, 25, W. ½ Lot 1,	Concession 11		to be charged	12
26, 1, 2, 3, 4, 21, 22, 23, Lot 1	" 11		"	16
Part S. ½ 1, Part S. ½ 1, Lot 1	" 11		"	07
7, 12, 13, 14, 17, 18, 15, 16, W. ½ 2	" 11		"	16

Not on Assessment Roll of 1906.

Part S. ½ 2	Concession 11		"	58

Not on Assessment Roll, 1907.

Lots 12, 13 on 2	Concession 11		"	03
S. E. part 2	" 11		"	16
Village Lot 3	" 11		"	02

Omitted on 1907 Roll.

Old Government.—By-law 40.

L. & St. C. R.R.			to be refunded	$2 70
Park C. D.	on 6 M.R.N.	(G. W. Ainslie)	"	22
Village Lot 16	" 6 M.R.N.	(D. McAlister)	"	18
" " 58	" 6 M.R.N.	(J. Cranston)	"	07
" " 10, 11	" 7 M.R.N.	(C. L. McDermott)	"	05
" " 24	" 6 M.R.N.	(R. O. Y. Ainslie)	"	15
" " B	" 6 M.R.N.	(G. A. Ainslie)	"	08
Lot W. ½ 19	Concession 11	(W. J. Bell)	"	25
W. ½ E. ½ 19	" 11	(T. Bell)	"	13
E. ½ 19	" 11	(D. Bell)	"	13

Charged in error on 1909 Roll.

No. 4 Government.—By-law 46, W. 2-3 S. ¾ 8, concession 11, to be charged 3 cents. Omitted on 1907 Roll.

Alexander.—By-law 68.

Village Lots 1, 2 on 1,	Concession 11		to be charged	$0 23
" " 6 " 1 "	11		"	23
" " 7 " 1 "	11		"	23
" " 14 " 1 "	11		"	23
" " 15 " 1 "	11		"	23
" " 16 " 1 "	11		"	23
" " 17 " 1 "	11		"	23
" " 18 " 1 "	11		"	23
" " 19 " 1 "	11		"	23
" " 20 " 1 "	11		"	23
" " 21 " 1 "	11		"	23
" " 22 " 1 "	11		"	23
" " 23 " 1 "	11		"	23
" " 24 " 1 "	11		"	23
" " 27 " 1 "	11		"	23
" " 28 " 1 "	11		"	23
" " 29 " 1 "	11		"	23
" " 30 " 1 "	11		"	23
" " 20 " 1 "	11 E. of R.R.		"	23

Village Lot	12	on 2,	Concession	11		"	23
" "	13	" 2	"	11		"	23
" "	18	" 2	"	11		"	23
" "	19	" 2	"	11		"	23
" "	4	" 2	"	11		"	23
" "	8	" 2	"	11		"	23
" "	11	" 2	"	11		"	23
" "	13	" 2	"	11		"	23
" "	16	" 2	"	11		"	23
" "	17	" 2	"	11		"	23
" "	18	" 2	"	11		"	23
S. part Lot 1, Concession 11						"	23
Part of S. part 1, Concession 11						"	23
Gore 1, 2, 3, Concession 9 to be charged (J. S. Ainslie)							45 37

These are all omitted on 1904 Roll.

The pro-rating of the schedule totals $564.08, but is totalled $564.90, an error of 82 cents.

The assessment on N. part lot 3, concession 11, $171.80, was paid to the Treasurer before the debentures were issued. This, with total interest, $26.65, makes a total of $36.69 short on each total annual payment.

Big Creek.—By-law 45. There is an overcharge in the amount collected of 21 cents, extending over 3 years, but as there are numerous changes of .01, .02, .03 cents each and a variation of a fraction in over a 100 of them, the overcharge is very easily understood.

Turnbull.—By-law 94. J. A. Buchanan, page 2, No. 26, to be refunded 35 cents. Charged in error on 1906 Roll.

I. Smith, page 16, No. 305, to be charged .03 cents, undercharged on 1906 Roll.

No. 3 Government.—By-law 146, E. ½ S. ½ lot 9, concession 10, to be charged 5 cents, undercharged on 1909 Roll.

Under an agreement with the Council this amount was allowed in lieu of the reduction by the Court of Revision on appeal. This has not been charged on the 1910 Roll, and the Council should immediately pass a by-law confirming the agreement. Failing them taking such action, the amount will have to be charged against the lands.

SUMMARY OF ROLLS, 1904 TO 1909, BOTH INCLUSIVE.

Item.	1904	1905	1906	1907	1908	1909	Total.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
County Rate	1,288 92	1,412 24	1,884 68	1,883 02	1,836 40	1,856 31	10,161 57
Township Rate	1,187 45	1,210 30	1,255 00	1,664 01	2,427 70	2,448 13	10,192 59
Special Road Drainage	1,356 55	1,057 61	1,130 83	1,412 58	1,836 40	1,856 32	8,650 29
General School Rate	1,196 21	1,240 59	2,513 68	2,421 53	2,352 58	2,336 00	12,060 59
L. & St. C. R. R. Bonus	509 97	527 11	146 95	.....	.....	.....	1,184 03
Turnbull .....Drain	744 75	559 46	559 78	559 46	.....	.....	2,423 45
Alexander ..... "	471 66	.....	.....	.....	.....	.....	471 66
Big Creek ..... "	1,490 62	1,490 97	1,491 47	.....	.....	.....	4,473 06
Old Government... "	975 47	979 11	.....	.....	.....	.....	1,954 58
No. 4 Government. "	158 15	158 15	158 15	158 12	.....	.....	632 57
Robb-Dales..... "	450 54	450 44	450 54	433 15	461 34	.....	2,246 01
Jones..... "	87 77	87 77	87 77	87 77	.....	.....	351 08
Little Creek ..... "	430 86	693 75	262 89	262 89	262 89	244 41	2,157 69
Ruscomb ..... "	125 99	125 72	125 23	125 59	.....	.....	502 53
No. 1 Government . "	611 96	618 90	618 03	581 27	.....	.....	2,430 16
No. 2 Government . "	.....	222 40	225 61	225 61	225 61	225 61	1,124 84
West Town Line .. "	.....	.....	224 91	225 91	225 91	225 91	902 64
6 and 7 Side Road. "	.....	.....	107 73	113 62	116 37	114 31	452 03
18 and 19 Side Road "	.....	.....	150 62	150 62	150 62	150 62	602 48
Malden Road East "	.....	.....	129 65	129 65	129 65	129 65	518 60
Malden Road Outlet "	.....	.....	210 88	210 88	209 72	229 93	861 41
7 Concession Exten. "	.....	.....	163 95	.....	.....	.....	163 95
Plouffe..... "	.....	.....	.....	68 56	68 56	68 56	205 68
No. 3 Government. "	.....	.....	.....	270 59	275 21	272 84	818 64
Kinsman ..... "	.....	.....	.....	130 74	130 74	130 74	392 22
Turnbull Supple'ry "	.....	.....	.....	.....	577 83	.....	577 83
Turnbull Bridge .. "	.....	.....	.....	.....	45 78	45 78	91 56
Robb-Dales Bridge. "	.....	.....	.....	.....	.....	94 10	94 10
Hyatt ..... "	.....	.....	.....	.....	69 51	69 51	139 02
6 and 7 Side Road Supplementary . "	.....	.....	.....	.....	234 06	.....	234 06
Police Village of Comber General Rate	837 48	635 74	818 26	1,084 47	871 82	1,120 57	5,368 34
Police Village of Comber Special Rate.....	.....	.....	250 50	.....	.....	.....	250 50
Police Village of Comber Statute Labor.....	240 75	242 25	255 00	269 25	254 25	257 25	1,518 75
Police Village of Comber Silex Walks.....	272 65	272 65	611 04	547 43	461 74	487 15	2,642 66
Village of Staples Silex Walks	.....	.....	.....	.....	.....	85 13	85 13
Commutation of Statute Labor	34 00	13 00	65 00	5 00	2 00	66 00	185 00
Arrears of Taxes	24 87	42 13	.....	24 52	83 61	35 96	211 09
Awards D. & W. C. Act.	124 00	45 00	118 50	28 00	175 70	204 16	695 36
Dog Tax.....	206 00	199 00	184 00	205 00	200 00	214 00	1,208 00
No. 4 Public School	1,118 00	983 25	739 82	1,244 10	1,348 80	1,958 71	7,392 68
No. 5 Public School.....	132 85	181 98	194 52	116 58	59 67	36 67	722 27
No. 1 and 7 Public School	406 82	427 55	315 63	260 45	46 93	67 86	1,525 24
No.9 and 14 Public School	174 55	172 97	72 08	119 06	119 78	137 40	795 84
No. 8 Public School.....	272 28	322 20	227 68	200 69	141 47	179 03	1,343 35
No. 12 Public School....	198 66	377 90	189 15	279 55	257 45	297 62	1,600 33
No. 13 Public School ...	134 78	76 88	45 00	92 11	58 94	63 17	470 88
No. 15 or 16? Public School	224 18	214 84	82 01	82 68	81 98	62 60	748 29
No. 2 Separate School..	49 95	47 60	50 92	72 40	90 03	80 30	391 20
No. 7 Separate School ..	53 60	57 90	69 41	65 70	46 04	67 18	359 83
No. 11 Separate School.	147 89	145 14	163 20	194 45	51 66	190 78	893 12
No. 9 and 14 Separate School	169 34	133 38	278 67	164 20	224 42	226 39	1,196 40
	15,909 52	15,425 88	16,628 74	16,161 17	16,213 17	16,336 66	96,675 18

STATEMENT OF AMOUNTS TO BE CHARGED AGAINST LANDS, FOR THE UNEXPIRED PERIOD OF ANNUAL ASSESSMENTS, AS SHOWN BELOW.

Drain.	By-law.	Date.	No. years.	To be charged on Rolls of				
				1910	1911	1912	1913	1914
				$ c.	$ c.	$ c.	$ c.	$ c.
Plouffe	147	1907	5	68 56	68 56			
Hyatt	151	1908	5	69 51	69 51	69 51		
Kinsman	145	1907	5	130 74	130 74			
No. 3 Government	146	1907	5	272 89	272 89			
18 and 19 Side Road	136	1906	5	150 62				
West Town Line	132	1906	5	225 91				
Maldon Road East	134	1906	5	129 65				
Malden Road Outlet	135	1906	5	210 88				
Robb-Dales Bridge	154	1908	2	88 74				
6 and 7 Side Road	133	1906	5	114 08				
Turnbull Drain Bridge	153	1908	5	45 30	45 34	45 30		
No. 4 Government	171	1910	5	536 92	536 92	536 92	536 92	536 92
				2,043 80				

STATEMENT OF AMOUNTS TO BE CHARGED ON ROADS (GENERAL ROAD DRAINAGE) FOR THE UNEXPIRED PERIOD OF ANNUAL ASSESSMENTS, AS SHOWN BELOW.

Drain.	By-law.	Date.	No. years.	To be charged on Rolls of				
				1910	1911	1912	1913	1914
				$ c.	$ c.	$ c.	$ c.	$ c.
Plouffe	147	1907	5	3 81	3 81			
Hyatt	151	1908	5	21 60	21 60	21 60		
Kinsman	145	1907	5	9 00	9 00			
No. 3 Government	146	1907	5	53 01	53 01			
18 and 19 Side Road	136	1906	5	65 00	65 00			
West Town Line	132	1906	5	110 64				
Malden Road East	134	1906	5	47 05				
Malden Road Outlet	135	1906	5	31 18				
Robb-Dales Bridge	154	1908	2	137 14				
6 and 7 Side Road	133	1906	5	53 01				
Turnbull Bridge	153	1908	5	10 17	10 17	10 17		
No. 4 Government	171	1910	5	117 09	117 09	117 09	117 09	117 09
				658 70				

POLICE VILLAGE OF COMBER.

STATEMENT OF AMOUNTS TO BE CHARGED AGAINST LANDS, FOR THE UNEXPIRED PERIOD OF ANNUAL ASSESSMENTS, AS SHOWN BELOW.

By-Law.	Date,	Annual Payment.	No. Years.	To be charged on Roll of 1910.	
		$ c.			
10	1906	158 97	5	$151 61	Less $7.36 M.C.R.R. Assessment.
11	1906	196 44	5	184 34	Less $12.10 M.C.R.R. and Eng. Church Assess't.
17	1909	161 83	5	161 83	
.....	.....	.....	.....	497 78	

VILLAGE OF STAPLES.

STATEMENT OF AMOUNTS TO BE CHARGED AGAINST LANDS, FOR THE UNEXPIRED PERIOD OF ANNUAL ASSESSMENTS, AS SHOWN BELOW.

By-Law.	Date.	Annual Payment.	No. Years.	To be charged on Rolls of			
				1910	1911	1912	1913
165	1909	$85 24	5	$85 24	$85 24	$85 24	$85 24

POLICE VILLAGE OF COMBER.

Statement showing amounts charged and recovered on lands for Silex walks assessments, for the years 1904 to 1909, both inclusive.

B-law.	Date.	Annual payment.	No. years.	Charged on lands in rolls of						Total charged on lands.	Amount due as per by-law,	To be refunded on 1910 taxes.	To be charged on 1910 Taxes.
				1904	1905	1906	1907	1908	1909				
		$ c.		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.		
83	1902	68 73	5	68 73	68 73	68 73	.....	.....	.....	206 19	206 19	.....	.....
100	1903	62 99	5	62 99	62 99	62 99	62 99	.....	.....	251 96	251 96	.....	.....
106	1904	140 93	5	140 93	140 93	140 93	140 93	.....	.....	704 65	704 65	.....	.....
10	1906	158 97	5	.....	.....	147 86	151 50	136 47	144 16	579 99	635 88	See statement.	.....
11	1906	196 44	5	.....	.....	190 53	182 01	184 34	181 16	738 04	785 76	See statement.	.....
17	1909	161 83	5	.....	.....	.....	.....	.....	161 83	161 83	161 83	.....	.....
Special	Rate.	.....	.....	.....	.....	250 50	.....	.....	.....	250 50	250 50	.....	.....
.....	.....	.....	.....	272 65	272 65	861 54	537 43	461 74	487 15	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,893 16	2,996 77	.....	.....

VILLAGE OF STAPLES.

165	1909	85 24	.....	.....	.....	.....	.....	.....	85 13	85 13	85 24	.....	11

BALANCE SHEET AS AT DECEMBER 31, 1909.

Assets

Cash in Northern Crown Bank		$1,537 04
Uncollected Taxes	$12,622 06	
Arrears in County Treasurer's Bonds, Taxes	162 86	
		12,784 92
Staples Silex Walk		277 44
Alexander Drain	$6 25	
7th Concession Extension Drain	2 00	
18 and 19 Side Road Drain	5 19	
Plouffe Drain	5 74	
Kinsman Drain	15 20	
Malden Road East Drain	14 11	
Malden Road Outlet Drain	10 39	
Big Creek Drain	446 28	
Robb-Dales Bridge	331 91	
		830 82
L. and St. C. R.R. Bonus		11 54
Provincial Audit, Comber	$35 98	
" " Staples	11	
" " Awards	70 15	
" " Statute Labour	45 75	
" " Drains	112 53	
		264 52
Township of Mersea		103 19
Town Hall and Furniture		2,000 00
S. T. Anderson, Balance		40 13
		$17,849 90

Liabilities.

Separate School No. 2	$80 30	
" " " 7	67 18	
" " " 11	190 78	
" " " 9 and 14	226 39	
Public School No. 1 and 7	322 86	
" " " 4	3,058 71	
" " " 5	196 20	
" " " 8	449 03	
" " " 12	388 62	
" " " 13	156 17	
" " " 9 and 14	302 40	
" " " 15 or 16 ?	149 60	
		$5,588 24
Debentures (Principal only)		7,221 71
Sheep Killed		222 68
Township of Romney	$75 00	
Township of Rochester	30 50	
		150 50
Police Village of Comber		257 31
No. 1 Government Drain, By-laws 93, 97	$30 35	
Malden Road Drain, By-law 47	27 30	
Ruscomb Drain, Bylaw 142	25 64	
6 and 7 Side Road Drain, Bylaw 29	84 04	
No. 4 Government Drain, By-law 46	19 00	
No. 2 Government Drain, By-laws 126, 127	37 12	
Turnbull Drain, By-laws 152, 153	81 68	
West Town Line Drain, By-law 132	10 33	
6 and 7 Side Road	23 91	
		339 37
Provincial Audit Refunds		22 27
Fees and Fines		75
S. T. Anderson, Balance		143 00
Surplus of Assets over Liabilities		3,949 07
		$17,849 90

Description.	By-law.	Year of issue.	No. of years.	Issued for.	Int.	No. of years to run.	Principal unpaid.
				$ c.			$ c.
Comber Silex Walks	10	1906	5	1,689 64	5	2	725 66
" " "	11	1906	5	835 20	5	2	358 70
" " "	17	1909	5	2,011 25	5	5	2,011 25
No. 2 Government Drain	126.127	1905	5	1,280 00	5	1	281 57
" 3 " "	146	1907	5	1,411 00	5	3	887 51
West Town Line "	132	1906	5	1,457 00	5	2	625 74
6 and 7 Side Road	133	1906	5	723 40	5	2	310 69
Malden Road East	134	1906	5	765 00	5	2	328 55
" " Outlet	135	1906	5	1,048 00	5	2	450 10
18 and 19 Side Road	136	1906	5	794 50	5	2	341 22
Plouffe	147	1907	5	313 30	5	3	197 07
Kinsman	145	1907	5	605 00	5	3	380 55
Hyatt	151	1908	5	394 50	5	4	323 10
	.....	.....	.....	13,327 79	.....	.....	7,221 71

Description.	No. of Debenture.	Amount of Debenture.	Amount of this year's coupons.	Total Debenture and Coupon.	Date when due 1910.
		$ c.	$ c.	$ c.	
Comber Silex Walks	4	353 98	36 28	390 26	Sept. 24
" " "	4	174 98	17 93	192 91	Sept. 24
" " "	1	363 98	100 57	464 55	Sept. 24
No. 2 Government Drain	5	281 57	14 08	295 65	Dec. 26
" 3 " "	3	281 53	44 37	325 90	Oct. 23
West Town Line "	4	305 24	31 29	336 53	July 25
6 and 7 Side Road "	4	151 56	15 53	167 09	July 25
Malden Road East "	4	160 27	16 43	176 70	July 25
" " Outlet "	4	219 56	22 50	242 06	July 25
18 and 19 Side Road "	4	166 45	17 06	183 51	July 25
Plouffe "	3	62 51	9 86	72 37	Oct. 22
Kinsman "	3	120 72	19 02	139 74	Oct. 22
Hyatt "	2	74 97	16 15	91 12	Sept. 23
	.....	2,717 32	361 07	3,078 39	

STATEMENT OF ACCOUNT WITH COUNTY TREASURER, FOR ARREARS AND NON-RESIDENT TAXES.

				Date.			
1904							
Jan. 1.	Balance as per Pro. Audit	$82	12	1904	Cash from County Treasurer	$64	23
1904	Uncollected Taxes	184	41	1905	Cash from County Treasurer	327	18
1904	Non-Resident Taxes	98	26	1905	C. L. McDermott	1	91
1905	Uncollected Taxes	173	91	1906	Cash from County Treasurer	299	37
1905	Non-Resident Taxes	41	18	1907	Cash from County Treasurer	116	32
1906	Uncollected Taxes	238	88	1908	Cash from County Treasurer	161	63
1906	Non-Resident Taxes	130	07	1909	Cash from County Treasurer	278	73
1907	Uncollected Taxes	212	40		Bal. due Tilbury West	162	86
1907	Non-Resident Taxes	1	31				
1908	Uncollected Taxes	221	11				
1908	Non-Resident Taxes	5	78				
1909	Non-Resident Taxes	22	80				
		$1,412	23			$1,412	23

TOWNSHIP OF MERSEA.

IN ACCOUNT WITH TOWNSHIP OF TILBURY WEST.

1893				1904			
Dec. 20	Due under B/L 18, Buchanan Drain	$70	00	Dec. 22	By Cash — Principal, $115.95; Interest, $14.35	$130	30
	Interest to July 15, 1904.	40	00	1908			
1898	Half Cost Survey, plan, etc., Lowden Drain	44	50	Dec. 31	By Cash — Principal, $70.00; Interest, $40.00.	110	00
	Interest to July 15, 1904.	17	35	1906			
1900				July 20	By Assessment of Reid Drain	50	00
June 3	Share of Debenture Union School 12 and 15	115	95		By Interest on $50.00 from July 20, 1906, to Dec. 31, 1909	8	63
	Interest to July 15, 1904.	28	70	1905			
	Interest on $230.45 from July 15, to Dec. 22, 1904	5	03	Aug. 8	By Assessment of Wyatt Drain	95	00
	Interest on $114.50 from Dec. 23, 1904, to Dec. 31, 1908	23	04		Interest on $95.00 from Aug. 8, 1905, to Dec. 31, 1909	20	90
	Interest on $44.50 from January 1, to Dec. 31, 1909	2	22	1909			
1908	Their proportion assessment Robb-Dales Drain Bridge	162	00	Dec. 31	Balance due Tilbury West	103	19
Nov. 11	Interest from Nov. 11, 1908 to Dec. 31, 1909	9	23				
		$518	02			$518	02

STATEMENT SHOWING COLLECTION AND DISTRIBUTION OF GENERAL SCHOOL RATE.

Distribution.	1904	1905	1906	1907	1908	1909	Total.
School No. 1 and 7	126 76	126 76	253 52	253 52	253 53	255 00	1,269 09
School No. 4	550 00	550 00	1,100 00	1,100 00	1,100 00	1,100 00	5,500 00
School No. 5	88 50	88 50	177 00	177 00	177 00	180 00	888 00
School No. 8	136 37	136 37	272 72	272 72	272 72	270 00	1,360 90
School No. 12	141 86	150 00	283 73	283 73	283 83	291 00	1,434 15
School No. 13	45 00	45 00	90 00	90 00	90 00	93 00	453 00
School No. 14	90 00	90 00	180 00	180 00	180 00	165 00	885 00
School No. 15 or 16	102 50	102 50	123 00	123 00	123 00	87 00	661 00
	1,280 99	1,289 13	2,479 97	2,479 97	2,480 08	2,441 00	12,451 14
Collected on Rolls	1,196 21	1,240 59	2,513 68	2,421 53	2,353 58	2,336 00	12,060 59
Surplus	.....	.....	33 71	.....	.....	.....	.....
Deficiency	84 78	48 54	.....	58 44	127 50	105 00	390 55

STATEMENT SHOWING DISTRIBUTION OF MONEYS AND PRESENT STANDING OF SEPARATE SCHOOLS.

Explanation of Debits.	2		7		11		9 and 14		Explanation of Credits.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
Paid by Treasurer	366 90	391 20	362 18	359 83	1,058 82	893 12	1,144 41	1,196 40	Levy.
	.....	.....	.....	.....	.....	7 00	.....	.....	Special Rate.
	.....	56 00	.....	69 53	.....	349 48	.....	195 33	Balance as per Provincial Audit.
Transferred to General Fund	.....	.....	.....	.....	.....	.....	9 68	.....	
Error in Account	.....	.....	.....	.....	.....	.....	11 25	.....	
Balance due 1st Jan., 1910	80 30	.....	67 18	.....	190 78	.....	226 39	.....	
Totals	447 20	447 20	429 36	429 36	1,249 60	1,249 60	1,391 73	1,391 73	

STATEMENT SHOWING DISTRIBUTION OF MONEYS

Explanation of Debits	1 and 7		4		5		8	
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Paid by Treasurer...	2,390 15	1,269 09	12,659 72	5,500 00	1,964 86	888 00	3,034 65	3,341 73
Debentures paid.....	461 93	1,525 24	514 81	7,392 68	.....	722 27	.....	.....
Difference as per pro. audit.....	81 56	283 42	.....	1,366 29	.....	321 25	.....	.....
Journal entry, no explanation.....	.....	.....	.....	.....	2 00	.....	.....	.....
.....	.....	178 75	.....	.....	.....	.....	.....	.....
.....	.....	380 26	.....	1,974 27	.....	231 54	.....	420 01
Errors in crediting Journal entries....	380 26	.....	.....	.....	.....	.....	.....	.....
Balance due 1st Jan., 1910.....	322 86	.....	3,058 71	.....	196 20	.....	449 03	.....
Totals.....	3,636 76	3,636 76	16,233 24	16,233 24	2,163 06	2,163 06	3,483 68	3,483 68

No. 5 Account is overcredited $20.00, the credit for 1905 reads $290.48 should read

AND PRESENT STANDING OF PUBLIC SCHOOLS.

12		13		9 and 14		15 or 16?		Explanation of Credits.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
3,341 73	1,434 15	947 24	453 00	1,759 56	885 00	2,055 93	661 00	Division of General Rate.
.....	1,600 33	.....	470 88	.....	795 84	.....	748 29	Levy.
.....	256 26	.....	29 35	.....	198 43	.....	433 99	County and Government Grants.
.....	130 30	.....	.....	.....	.....	.....	.....	Township Mersea Share of S.S. No. 12 Debenture.
.....	.....	.....	.....	.....	.....	.....	.....	Township Tilbury N. Share of S.S. Nos 1/7 Debenture.
.....	417 00	.....	150 18	.....	165 82	.....	348 60	Balance as per Provincial Audit.
107 69	.....	.....	.....	.....	16 87	.....	13 65	Errors in crediting, Journal entries.
388 62	.....	156 17	.....	302 40	.....	149 60	.....	
3,838 04	3,838 04	1,103 41	1,103 41	2,061 96	2,061 96	2,205 53	2,205 53	

$270.48. Amount due for 1st Jauuary, 1910, reads $216.67 should read $196.20.

GRAVENHURST, 9th September, 1910.

To the Mayor and Council of the Municipality of Gravenhurst:

GENTLEMEN,—In accordance with order in Council of the Province of Ontario, dated May 31st last, issued upon a petition signed by some sixty ratepayers, I, at the request of the Provincial Municipal Auditor, J. W. Sharpe, Esq., came to your town on June 4th last, and hearing that his Worship was leaving for Toronto the next day at once interviewed him and produced my credentials. In talking over the position of affairs generally, it appeared that the accounts at the substation required first attention to enable the newly appointed Sec. Treas. to intelligently proceed with the collection of the sums due for current, light, power, and water. I found the books in a most deplorable condition, they had not been made up or balanced for years, and I decided the best thing to do was to issue the bills for current month, leaving the balances to be adjusted as soon as possible after the figures were made intelligible. This was done and the money collected enabled the commission to tide over their difficulties.

Having done this I turned my attention to the General Town accounts, and more particularly to the South Falls power scheme and the electric light plants upon which very large sums of money had been expended. These accounts I now submit in detail, made up in as short a form as possible, to enable you to make such comparisons as your local knowledge will warrant. I have gone thoroughly into detail in each case, scrutinized all vouchers, and supplied information such as was previously unobtainable. I am taking each statement and adding my remarks upon same as some guide to you in your conclusions.

GENERAL CASH ACCOUNT.

1908 Statements Nos. 1, 2, 3 and 4.

These show details of all receipts and disbursements from December 16, 1907, to December 15, 1908, under the many headings, and are followed in the same order for 1909.

1909 Statements Nos. 5, 6, 7, 8, 9.

The Town Treasurer issued printed statements in detail for both years, but there were so many typographical errors and bad summarizing under the several heads that I dissected each of them, and have placed all receipts and disbursements under their proper heads. As an example, take page 9, 1908. "Streets and Walks" is debited with $734.93; should be $743.93. At page 7 the salaries of team driver, caretaker of Clark Factory, caretaker of Town Hall, payments on account of streets and walks, etc., are shown simply as salaries and not to the debit of their respective accounts, hence the statement is misleading and there was no alternative but to dissect them to make the charges correct. In 1909 similar errors occur, rendering their use valueless.

1910 Statements Nos. 10, 11, 12, 13 and 14.

These cover 6 months to June 30th and month of July, 1910, and are in the same order as 1908 and 1909 so as to make comparison easy. This also applies to month of August, 1910, made up to this date in compliance with request of the Mayor, and closed the General Account to 31st ulto., at which date there is shown a balance of cash in hand of $831.59. This is explained in detail in statement No. 36.

Accounts.

Nos. 15 and 16.

Statements passed and not paid, and to be passed, to the 31st August, and is a good financial shewing as at that date, being in total the sum of $445.63.

South Falls Power Account.

Nos. 17, 18 Statements.

No. 17 is a summary of the disbursements on this.

Nos. 19, 20.

Heavy account, showing a turn over of $237,851.96, leaving as shown in *Nos. 21, 22, 23,* a credit balance, with the work completed, $634.50 cash in bank.

Nos. 16/23.

I would draw attention to the account of the Canada Foundry Co. Contract was for $6,600.00; they have already been paid $6,756.11. This in itself is not of much import, but if taken in conjunction with the Water Works installation there appears something wrong.

Water Works Account.

Nos. 24, 25 Statements.

These show the total receipts from Debentures, and the expenditures on this account, leaving a balance in bank of $1,439.75. There are, however, some payments under this head of large sums. I would refer to W. H. Johns' contract. It appears peculiar that the installing of galvanized pipe for the town, $403.76, should amount to the same as for domestic service. Of course, in looking over this account the contract was made on the several sizes of pipe, and it was necessary to make careful measurement seeing that the figure for blasting was 50c. per square foot. On page 24, under Johns' contract, the final estimate is shown as $205.18, but on page 25, January 8th, a balance on trenching is paid of $182.84. On January 10th the final account is shown as $740.86. This may be all right, but it strikes me as peculiar, and the work should be overlooked by a competent man.

Under the Water Works account I find a contract with the Canada Foundry Co. for pumps and motors of $2,340.00. There was paid $5,421,20, and still there is a "claimed" balance due of some $1,500.00. I can only take the South Falls Power and Water Works accounts together, and conclude that it would be worth while for an expert to say whether the town has had value for their money. There are several items that are mixed up between the two accounts, such as only an expert in this special line of business can dissect and divide in a proper manner.

Clark Factory.

No. 26 Statement.

The Town bonused this business with a Debenture for $10,000.00. The business failed and the factory was thrown on the hands of the Council. Since then, to August 6th, there has accumulated, for insurance, caretaking, taxes, etc., the sum of $5,242.49. An arrangement is going through for its sale for $6,500.00 which (after paying further law costs in this connection) will net the

town say $1,200.00, which, had it been kept as a going concern, would have saved the town $8,800.00 outside the benefit accruing from the employment of labor.

The factory was not included in the 1910 assessment, hence there is no claim for five months' taxes, as there would have been had it been assessed as it should have been, seeing that the rate was struck long after the negotiations were made for sale and practically closed. See notice of By-Law in Banner, which was issued one week and then withdrawn; this affects the ratepayers to a considerable extent and was an error.

Debentures.

No. 27 Statement.

These are all in order and have been paid in due course and provision practically made, and payments can be made out of the current year's revenue.

Public School Boards.

No. 28 Statement.

These accounts are all right and I show particulars of receipts and disbursements for years 1908 and 1909.

There were one or two matters I noticed, and I wrote the following to Mr. R. R. Stanley, the Secy.-Treasurer:—"With reference to conversation this A.M. In future kindly, in all cases, obtain from claimants a bill of particulars for submission to your Board and when approved mark on same 'passed for payment' on —— (giving date). When cheque is issued mark No. on face of bill for future references; close your cash book at end of year as I have closed 1909, this would be your statement, and showing, as it does, the expenditures under the several headings would be information to your Board and be a guide to their future demands from the Council of Gravenhurst for allowances in subsequent years.

"With regard to special items, such as the $9.76 from Educational Dept., these must all pass through your cash book as receipts, and whatever disposition is subsequently made of them by the Board will be recorded in the minutes and be your authority for disposal.

"I have no hesitation in attesting to your desire to keep everything straight, and with the suggestions as above acted upon I have no doubt you will do so, not only to the credit of yourself but to the entire satisfaction of your Board."

I do not anticipate any difficulty in this direction.

High School Board.

No. 29 Statement.

This shows receipts and disbursements for the years 1908 and 1909, noticing several indications of looseness in the manner of handling the accounts. I wrote Mr. L. Edwards, the recently appointed Secretary Treasurer, as follows: "I understand your appointment is only of recent date, and would, therefore, ask you to avoid the shortcomings of your predecessors.

"Do not accept or pass to your Board any account unless with a distinctive date. When passed endorse date so as to make it easy to trace through your minute book. When paid give date and number of cheque in all cases, and

when entering in cash book say what the payment covers, namely, supplies, repairs, salaries, etc. This will enable you to summarize the items under the several heads, and, not only be a guide to your Board, but also enable the Council to know how the money, for which they tax the ratepayers, is being spent.

"I want to see the Fire Insurance Policy. You must arrange also at once a Guarantee Bond."

In connection with the public and high schools, I am told when demand is made for a levy it is accepted and no questions asked. It is the duty of the Council to receive with such demand a statement of the purposes for which the taxpayers' money is to be applied. It does not follow that in all cases the demand must be complied with. The statements for expenditures are given side by side for the two years. The necessity for watching the same will be apparent if the ratepayers' interests are to be conserved.

Assets and Liabilities.

No. 30, 31, 32 Statements.

The available, or liquid, assets available on the 31st August amount to $26,-963.69, and the liabilities, or payments due or accruing this year, as regards debentures and floating debt at bank, amount to $14,653.07, showing a balance in favor of the town of $12,312.62 for running expenses to 31st December next.

Insurance and Guarantee Bonds.

No. 33 Statement.

The policies issued appear in order. There is not, however, any insurance on the following properties:

Town Fire Engine, etc.
Power House and Machinery therein.
Band Stand, Gull Lake.
Band Instruments, Uniforms and Equipment.
Town Team and Equipment.

The Fidelity Bonds of the Town Clerk (Mr. Cross), the Sec.-Treas. of the E. L. Power and Water Company (Mr. Shannon), and the Sec.-Treas. of the Public School Board (Mr. Stanley), are in order, and I have requested the Sec.-Treas. of the High School Board and the Tax Collector, Mr. Grant, to provide Bonds, for which I have given them the needful forms. These will no doubt be filled out at an early date.

Archy Sloan disputed Salary Account.

No. 34 Statement.

This shows the payments made to Sloan and the sum due to him for salary to 31st August, and explains the difference of $200.00 between the amount claimed by him, $565.00, and the sum due to him, $365.00.

W. H. Cross, Town Clerk and Treasurer, Salary Arrears.

No. 35 Statement.

In this case Mr. Cross put in a claim for $523.31, but on a close check I found he had not debited himself with $217.67. He admits this, and accepts balance due as $306.64.

W. H. Cross, Balance on Hand 31st August, 1910.

No. 36 Statement.

I have gone thoroughly into this, amounting to $831.59, and he has produced vouchers, etc., which he claims to have paid back as far as 1907. It is for the Council to go into this, in the event of Mr. Clairmont, Chairman of Finance, not doing so, but it appears to me he is the right man to deal with the matter and report to Council. The sooner this is dealt with the better for all concerned, as without doubt it discloses a looseness that should not exist. In this connection I would point out that the Statement for 1908, page 4, says: "January 1st, to Balance on Hand and in Bank, $1,268.18." This was not so, as at the time the Bank account was overdrawn $100.86. I further find that the average amount as shown in hand during 1908 was $1,143.23, for 1909 $882.44, and for the seven months ended July 31, 1910, $897.23. Mr. Cross, of course, did not hold all this cash all the time, but some of it he must have had in hand. This, by any stretch of the imagination, cannot be justified.

General.

The following amounts should be refunded by A. Sloan, Town Constable, acting as D. R. O. at elections, April 2, 1908. Ledger folio 94, $10.00; same folio $8.00. January 30, 1909, $4.00 = $22.00.

June 22, 1909, pay to A. Mowry $742.00, W. F. Wasley $742.00. Again in interest account the following items are charged $23.76 and $22.26 respectively. Mr. Cross endeavoured to explain the Mowry entry but I could not understand.

The party, I am told, for whom $150.00 was had from Mowry paid the latter 15 per cent. interest.

In connection with the following minute of January 10, 1906:

"After discussion it was resolved that the commission be allowed free light hereafter."

This is improper and I have debited each of the members during the period with all amounts discovered in the books, some $500.00, to 31st December, 1909. The present Commission have not taken any notice of this most irregular proviso and pay their bills like other consumers.

Mr. Cross has been instructed as follows with regard to Taxes:

Memo.

In future, commencing with the 1910 assessment, Taxes should be passed through the Ledger in the following manner:

Collector of Taxes	Dr.
Town Rate General Purposes	Cr.
High and Public School Levy	
Debentures and Interest.	

As collections are made they should be credited in total each month to the Tax Collector's Account from the Cash Book. This will enable you at any time to ascertain the amount unpaid. The total should check with the Collector's statement added to the balance shown unpaid, with the reasons therefor, duly signed and sworn to by the collector. The total should then be transferred to a new account, headed "Uncollected Taxes, 1910," thus bringing the items into a condensed form and at the same time testing the accuracy of the Collector's return.

The above should be made Journal Entries, and one should be at once opened and special items passed through it. It would simplify and assure correctness of the entries and assist the audit.

The Ledger, partly posted for 1910 already, should be kept up and closed and balance sheet drawn therefrom at the end of the year.

The work at the substation since May 1st has been well and accurately done, Mr. Shannon has applied himself intelligently to his task, the Chairman is not only closely following him, but is making a strenuous effort to bring order out of chaos.

In connection with the substation there is an amount of some $700.00 that nas never been billed to consumers or the balance brought forward. I will now apply myself to clearing up these and report the result later on. Some of the records are, however, missing and serious loss will result. Speaking generally of the Electric Light plant, it is without doubt a paying proposition and under the present supervision the future is assured.

Salaries should be closed up monthly and Mr. Cross is instructed to this end. All accounts should be submitted at the regular meeting of the council unless under very special circumstances. When a special meeting is called the business to be discussed should be given on the notice to each member of the council and no other transacted. This will do away with the rushing through of any scheme and be a check upon irregularities.

There are many other irregularities to which I could refer, amongst others the non-signing of the minutes of the meetings of the Council, in fact more important is the fact that By-Laws Nos. 383, 4, 5, 6, 7, 8, 9, and 390, 391, 2, 3, 4, 5, 6, 7, 7a, 8, 9, and 400, 401, 2, 3, 4, 5, 6, 7, 8, 9, 410, 411, 2, 3, and 4, all during the latter part of the time Mr. Slater was Mayor, none of them were signed up to August 10, 1910. The same slipshod methods applied to drafts and cheques, the former were accepted and the latter signed by Mr. Cross and paid by the Bank. There has not been any such looseness since Mayor Vanstone has held this high position, and, generally speaking, the affairs of the town are assuming a business aspect which in the end must be of great benefit to the ratepayers.

I had almost overlooked this: The weigh scales, which are presumed to be used as a check for the benefit of the ratepayers, are practically under the control of Messrs. Slater and Johns; the present lessee only securing the lease on the understanding that he allowed this firm to weigh their own coal for a fixed sum per annum. Such a system should not be countenanced for one moment longer, and the Mayor could, with credit to himself and possibly benefit to the town, take his Council into his confidence and abate the evil.

In conclusion, it may be stated that Mr. Cross is a competent man and will in future endeavour to live up to demands made upon him. The Executive should, however, bear in mind the importance of his office, which cannot be filled from year to year, as he is the custodian of all records and documents bearing upon the interests of *all* the ratepayers, and I have made it clear to him not to allow any out of his possession, but keep them in his vault to produce when wanted by any person entitled to their perusal.

I am here practically at the request of many ratepayers and my suggestions for improvement in the methods and practices now in vogue touch the many points raised, and I trust after having been perused they will have more confidence in the future and forget the past.

Respectfully submitted,

EDWARD C. DAVIES,
Auditor, Toronto, Ont.

GRAVENHURST.

WATER WORKS CONSTRUCTION ACCOUNT, RECEIPT.

Dr.			
1909			
Aug. 1	Debentures per G. A. Stimson	$20,000 00	
	Premium and accrued interest	606 82	$20,606 82
Dec. 31	Bank interest	209 00	209 00
			$20,815 82
Cr.	Disbursements		
	Etlers & Clift, Contract.		
	Aug 14, No. 1, 28th, No. 2, Sept. 10 and 25, No. 3, Estimate..	490 00	
	Oct. 11, Final Estimate	140 00	
			630 00
	W. H. Johns, Contract.		
	Aug. 27, No. 1, Sept. 11 and 25, No. 2 and 3, Oct. 21, No. 4, Estimate	2,518 28	
	Nov. 6, Final Estimate	205 18	
			2,723 46
	A. C. Jerguson, Contract.		
	Nov. 16, Intake pipe, $150.00; Dec. 8th, $216.00	366 00	366 00
	W. H. Johns, Trenching.		
	Dec. 8, Galvanized pipe	403 76	
	Domestic Service	403 76	
			807 52
	B. R. Morey & Son, supplies	613 24	
	Samuel Benjamin & Co., supplies	357 21	
	Canada Foundry Co., supplies	5,451 20	
	Est. J. F. Young, fittings	28 63	
			6,450 28
	W. H. Johns, freight and cartage	191 42	191 42
	Printing and Advertising	15 50	
	Labour	140 48	
	General Charges Corporation	152 84	
	Pump House	434 23	
	Lead	192 59	
	Interest	2 74	
	Georgian Bay Wrecking Co. and Miscellaneous	111 97	
			1,050 35
			$12,219 03
1909			
Dec. 31,	Cash in Bank, Carried forward		8,596 79
			$20,815 82

GRAVENHURST.

WATER WORKS CONSTRUCTION ACCOUNT.

January 1st to July 31st, 1910.

1909.			
Dec. 31	Balance in Bank	$8,596 79	$8,596 79
1910.			
March 31	Installation Accounts Collected	134 18	
April 30	" " "	38 43	172 61
June 30	Interest Dominion Bank	100 20	100 20
			$8,869 60
	Disbursements.		
1910.			
Jan. 10	W. H. Johns, Final Account		$740 86
" 8	" Teaming	$35 65	
March 26	" Freight on Switches	2 03	
April 4	" Freight on Breakers	1 98	39 66

Jan. 8	W. H. Johns, Repairs to Mains		57 50
" 8	" Balance on Trenching Galvanized Pipes		182 84
" 5	Supplies, Clipsham & Sons	$1 85	
" 5	" " " Tools	75	
" 13	" Est. J. F. Young, Water Services	125 97	
" 14	" J. Morrison	68 12	
" 29	" Samuel Benjamin, Galvanized Pipe	222 52	
March 5	" Ecclestone Pipe	15 20	
" 24	" Westinghouse Circuit Breakers	20 00	
April 4	" " " "	176 40	630 81
Feb. 5	Georgian Bay Wrecking Co., Diving	50 00	50 00
" 5	Gartshore Thompson Intake Pipes	685 73	685 73
Jan. 7	Sundries, Telephone Tolls	90	
March 14	" Oil for Pumps	11 20	
" 1	" Postage Stamps	35	12 45
June 20	Westinghouse Switch Boards	10 00	10 00
	Cr.		$2,409 85
July 1	Balance in Bank		6,459 75
" 2	Supplies Canada Foundry Co.	$5,000 00	
" 14	Law Costs, N. F. Davidson, *re* C. F. Co. Contract	20 00	$5,020 00
Aug. 1	Balance in Bank		$1,439 75

Covering period August, 1909, to July 31st, 1910.

EDWD. C. DAVIES,
Auditor.

Gravenhurst, August 15, 1910.

CLARK FACTORY, GRAVENHURST.

December 31, 1908.	To balance Brought Forward		$215 00
1909.			
January	" Cash	$141 25	
February	" "	37 50	
March	" "	175 71	
April	" "	702 75	
May	" " For Law Costs, Insurance	136 25	
June	" " Liens, Wages, Repairs, etc	76 25	
July	" "	315 00	
August	" "	38 75	
September	" "	48 75	
October	" "	19 00	
November	" "	23 25	
December	" "	1 80	
"	" "	22 50	$1,738 76
1905	Taxes	225 12	
1906	"	235 20	
1907	" Paid in full.		
1908	"	840 00	
1909	"	840 00	2,140 32
1905-09	Interest	771 71	771 71
1910.			
January	To Cash, Caretaking	23 25	
February	" " "	23 25	
March	" " " and Insurance	210 28	
April	" " "	11 17	
May	" " "	33 75	
June	" " "	45 75	
July	" " "	23 25	
August	" " "	6 00	376 70
L.F. 290	Due on Clark Factory, August 6, 1910 (See Note)		$5,242 49

NOTE.—This Factory is not included in Assessment for 1910, and as possession was taken, say, August 1st, if proportion of, say, 5 months, based upon the 1909 assessment, there would be due, say, 5-12 of $840.00=$350.00. There is still a bill of Costs not yet rendered, due N. F. Davidson.

EDWD. C. DAVIES,
Auditor.

Gravenhurst, Sept. 1, 1910.

DEBENTURES—GRAVENHURST.

Original amount,	Date of issue.	Owing on July 31, '10	For	Payments due Dec. 31,'10		Balance due on principal Jan 1, 1911.
				Principal.	Interest.	
$ c.		$ c.		$ c.	$ c.	$ c.
15,000 00	March, '09	14,732 55	South Falls (power)	.....	375 00	14,357 55
4,000 90	April, '02	2,762 15	Municipal (general)	.....	.....	2,762 15
5,000 00	May, '06	4,318 14	Cement (side walks)	.....	.....	4,318 14
30,000 00	" '03	25,775 22	E. L. purchase	.....	.....	25,775 22
20,000 00	June, '09	19,643 40	Water Works	.....	.....	19,643 40
4,000 00	July. '98	2,028 24	Fire Hall	.....	.....	2,028 24
10,000 00	October, '00	6,436 11	Town Hall	477 97	238 73	5,958 14
5,000 00	" '94	2,739 37	High School	217 79	136 97	2,521 58
10,000 00	November, '05	9,298 72	Municipal	195 48	418 44	9,103 24
10,000 00	" '05	9,298 72	Clark Factory	195 48	418 44	9,103 24
2,000 00	" '05	1,859 75	Park	39 09	83 69	1,820 66
7,000 00	" '05	6,509 12	Sanitarium	136 83	292 91	6,372 29
					17 07	.....
850 00	" '95	665 07	H. School site	S. F.	42 30	648 20
45,000 00	December, '06	42,864 78	South Falls	784 08	2,143 23	42,080 70
167,850 00		148,931 34		2,046 72	4,167 78	146,491 75

EDWD. C. DAVIES,
Auditor.

Gravenhurst, August 31, 1910.

TORONTO, November 8, 1910.

To the Mayor, Chairman of Commission, Commissioners, and Members of Council, Municipality of Gravenhurst:

GENTLEMEN,—I am pleased to inform you that I have at last completed the audit of the accounts under the control of the Electric Light, etc., Commission and submit herewith statements covering the period for 1908 and 1909, also to the 30th April, 1910. It was necessary to bring matters up to this broken period in order to effect a definite closing and fixing of balances as affecting those in control to the 30th April last, and starting out on a correctly ascertained basis for those who are now directing this important end of the Town's business. The labor has been great and the complications of such a character as to dishearten any attempt to elucidate and bring into a focus the very many complexities as arose from start to finish. These were brought about by the grossest negligence, ignorance, want of proper books of record and a general indifference and lack of supervision. The result, I have no hesitation in stating, is a loss to the Town of considerable money, and I base my conclusions on the absence of many vouchers and records not now forthcoming. For several years past Mr. Eagleson, the Town Auditor, has pointed out the looseness and lack of vouchers in his annual reports, and it is not surprising that he declined to make any attempt to compile a statement for 1909. On the present Commissioners, Messrs. Laigh, Vanstone and Clipsham, assuming office they found how matters stood and on the 1st May last Mr. Shannon took the office of Secretary-Treasurer, and in my opinion wisely objected to take any responsibility for accounts or balances prior to that date. I have now got matters into the best shape possible with the material at hand, and Mr. Shannon accepts the balances as shown, and I feel safe in assuring you, Gentlemen, that a conscientious and intelligent effort will be made to deal with this very important asset in the future. Mr. Shannon has gone thoroughly into every balance and will no doubt zealously guard the interests entrusted to him.

THE ACCOUNTS.

Sheet No. 37 shows the receipts and disbursements for the period taken from the cash book in which there were innumerable errors in classification, and in order that you may appreciate the labors in connection with this I am enclosing my original summary with the alterations as made from such vouchers as were obtainable. I have given details as to how the cash balance is made up from which you will see that there was $528.60 cash in bank, $216.16 in the hands of Mr. Cross (since paid in), and $35.98 held by E. Smith, and still held.

Sheet No. 38-41—shows assets and liabilities, with statement in detail supporting each of the items of assets numbered for easy reference. The stores on hand 1st May were ascertained by taking stock (no previous record) and valued at $1,219.26. There is shown an item of outstanding accounts of $3,964.93, full details of which are given. Of this account there has been collected $2,445.63, leaving the sum of $1,039.82 to be dealt with. In this is included an account of $479.48, due from the late commissioner, and steps should be at once taken to collect this money. It is due the ratepayers, and no half measures should be permitted in securing a full settlement. I would draw attention to E. Smith's and W. H. Cross' accounts, $274.72. These are items said to be paid, but no trace of same in the cash book. There are many receipts held by Mr. Shannon and each entry of these is marked R on statement of details.

In the Liabilities is shown a sum of $1,493.97 unpaid accounts. Of this sum $1,245.58 has been paid, the difference in two accounts is explainable.

Sheet No. 40 shows the indebtedness of the Town to the Commissioners as at 30th April last, as $6,466.58 for street lighting current for Town property, etc. These figures are subject to adjustment.

Sheet No. 41 shows the working of the debenture interest and sinking fund, resulting in a balance due the Town of $1,867.19, or between the two accounts, sheets 40 and 41, a balance in favor of the Commission of $4,599.39 as at 30th April, 1910.

I would draw attention to the "Fuel Account." In 1906 it was $2,753.95, but in 1908 it was only $233.48, a remarkable difference, and may be explained, but I could not gather any information.

There is also the stores sold in 1908, $101.52. Apparently nothing was sold in the months of February, August and September, and only $1.85 during April and May. Again credit is taken by Enoch Smith for $105.27 under the heading of stores, $29.59; fuel, $11.11; sundries, $6.85; maintenance, $24.39; and construction, $33.33. These items were all passed by Mr. Eagleson. He may have seen vouchers, but they are not forthcoming now.

Sheet No. 42 shows particulars of all cash errors discovered in the audit, $2,446.40. Of this there has been paid or admitted, $1,062.02, the balance $1,384.38, remaining to be collected or adjusted.

There are several matters referred to in my earlier report that should receive attention, and I trust this will be done.

In the conclusion it is with feelings of the greatest satisfaction that I convey to His Worship, Mayor Vanstone, Chairman Leigh and Finance Chairman Clairmont, my thanks for their timely advice and assistance on many occasions, enabling me to bring some order out of chaos and enabling me to conclude my labor, of a character such as I have never encountered in over forty years experience in the juggling of figures.

Yours faithfully,

EDWARD C. DAVIES,

Auditor.

GRAVENHURST ELECTRIC LIGHT, POWER AND WATER COMMISSION ACCOUNTS.

Statement of Receipts and Disbursements, January 1st, 1908, to April 30th, 1910.

Receipts.

Brought forward from 1907		$280 37
For Current	$18,429 75	
" Installations (Divisions approximate)	2,243 17	
" Stores (Divisions aproximate)	812 18	
" Water	197 10	
" Power	51 03	
" Corporation General Account	50 00	
" Error C. B., August, 1908	8 68	
" Error C. B., September, 1908	1 47	21,793 38
Total		$22,073 75

Disbursements.

For Salaries	$6,047 76	
" Maintenance (Divisions approximate)	2,856 59	
" Stores (Divisions approximate)	3,119 31	
" Construction	2,628 42	
" Corporation of Gravenhurst	6,640 93	21,293 01
Balance made up as follows:		
Cash in Bank May 1st, 1910	$528 60	
" due from W. H. Cross, April 30th, 1910	216 16	
" due from E. Smith Dec. 31st, 1908	3 50	
" due from E. Smith, June 30th, 1909	32 48	780 74
Total		$22,073 75
Explanation of Bank Balance:		
Total Bank Debit for periods	$21,385 56	
Less Overdraft January 1st, 1910	89 68	$21,295 88
Total Bank Credit for period		20,767 28
Cash in Bank, May 1st, 1910		$528 60

EDWD. C. DAVIES,
Auditor.

Gravenhurst, Nov. 5, 1910.

Statement of Assets and Liabilities.

April 30th, 1910.

Assets.

Cash in Bank			$528 60
" due from Enoch Smith	39/B	$83 86	
" " " J. T. Brittick $19.86	39/C		
Less $3.00	39/CC	16 86	
" " " W. Brittick	39/C	28	
" " " T. Fowler	39/C	1 20	
" " " W. H. Cross	39	216 16	318 36
Stores on hand, Electric Light		793 70	
" " " Water Works		425 56	1,219 26
Outstanding Accounts, Current and Installation	39/D4	2,654 28	
" " due from Commissioners	39/D5	479 48	
" " Balances not Brought Forward	39/D5	831 17	3,964 93
Accounts said paid, W. H. Cross, not in Cash Book	39/A	168 35	
" " " S. Smith, not in Cash Book	39/B	106 37	274 72
Gravenhurst Corporation General Account for 40 Street Lighting and Town Property			6,466 58
Total			$12,772 45

Liabilities.

Unpaid accounts per List—Stoves		$713 84	
" " " " Maintenance		590 07	
" " " " Construction		.....	
" " " " Water Works		100 06	
" " " " Salaries		90 00	
Debentures and Coupons		.....	
			$1,493 97
Gravenhurst Corporation Debenture Interest and Sinking Fund account	$41 00		1,867 19
Balance to credit of Commission			$9,411 29
Total			$12,772 45

EDWD. C. DAVIES,
Auditor.

Gravenhurst, November 5, 1910.

GRAVENHURST.

Statement showing amounts due from various persons, being sums collected and not accounted for so far as ascertainable from the books of the Electric Light, Power and Water Commission.

		Since paid.	Amount.
W. H. Cross:			
Cash short on entries in C. B.		$216 16	$216 16
Cash collected and not accounted for in Cash Book..Stat. A.			168 35
General:			
Balances from 1909, omitted to be brought forward to January, 1910, as per "Summary"		325 19	831 17
Commission:			
Accounts due from members not previously charged in accordance with minute passed in their own interests on assuming office, and this in direct violation of the express terms of their obligation of office. The items are as under, viz.:			
F. Slater	$193 53		
Johnathan Groh	16 80		
J. S. Gibson	180 55		
John McKenzie	67 60 39		
Robert Fielding	21 00 D5		
			479 43
The accounts are entered in detail in the Sub-station Ledger.			
Enver Smith:			
Money received from Mowry & Sons early in 1907, not paid in as per Auditor Eagleson's report.....39/B			32 54
Ditto, Balance, 1907 ..... "			15 34
Cash Book Balance, 1908 ..... "			3 50
" " " 30th June, 1909 ..... "			32 48
Sums not accounted for .....Stat. 39/B			106 37
J. T. Brittick:			
Sums not accounted for ..... " 39/C and CC			16 86
W. Brittick:			
Sums not accounted for ..... " 39/C			28
Thos. Flowers:			
Sums not accounted for ..... " 39/C			1 20
		$541 35	$1,903 73
Less since collected			541 35
Still to collect			$1,362 38

EDWD. C. DAVIES,
Auditor.

November 3rd, 1910.

GRAVENHURST.

CORPORATION GENERAL ACCOUNT FOR STREET LIGHTING AND TOWN PROPERTY. WATER WORKS COLLECTION.

1906.				
Dec. 31	To Current Clark Factory		$6 52	
1907.				
Dec. 31	" " " "		5 30	
1908.				
Nov. 30	To Cash		193 48	
Feb.	" Balance		110 94	
1909.				
Dec.	" Current Clark Factory		52 80	
1910.				
Mar. and Apr.	" Collection on act. of Comm. Water Works act.		172 61	
				$541 65
1905	" Lights, Installations, Fire Halls, Town Hall		104 60	
1906	" " " " "		104 60	
1907	" " " " "		104 60	
1908	" " " " "		104 60	
1909	" " " " "		104 60	
Jan. to April	" " " " "		68 60	
				591 60
1905	Current for street lighting		$1,000 00	
1906	" " " "		1,000 00	
1907	" " " "		1,000 00	
1908	" " " "		1,000 00	
1909	" " " "		1,000 00	
Jan. to April	" " " "		333 33	
				5,333 33
				$6,466 58

GRAVENHURST.

CORPORATION OF GRAVENHURST & ELECTRIC LIGHT, POWER & WATER COMMISSION.

Debenture. Interest and Sinking Fund Account.

1907.				
May	By Debenture			$1,736 90
August	" Cash advanced			200 00
February	To Cash		$500 00	
April	" "		1,000 00	
May	" "		298 00	
1908.				
January	By Cash Advanced			50 00
May	" Debenture			1,734 90
October	" "			711 18
May	To Cash		300 00	
June	" "		100 00	
July	" "		375 00	
September	" "		100 00	
November	" "		200 00	
December	" "		500 00	
1909.				
March	By Sinking Fund			375 00
May	" Debenture			1,734 90
December	" " and Interest			2,927 31
January	To Cash		400 00	
February	" "		500 00	
May	" "		900 00	
September	" "		700 00	
December	" "		1,730 00	
1910.				
March	By Sinking Fund and Interest			642 45
"	To Cash		642 45	
			$8,245 45	$10,112 64
	To Balance due Corporation		1,867 19	
	Total		$10,112 64	$10,112 64

EDWD. C. DAVIES,
Auditor.

Gravenhurst, 5th November, 1910.

GRAVENHURST.

STATEMENT OF AMOUNT DISCOVERED TO CREDIT OF TOWN AND COMMISSION DURING AUDIT, 1910.

			Town.	Comm.
Report	6	A. Sloan, error in Salary Claim	$200 00	
"	11	" Beatty Cemetery account	5 00	
"	7	" D. R. O. Fees to return	22 00	
"	6	W. H. Gross error in Salary Claim	216 67	
		" " struck out of claim to cover shortage per cent. on taxes	75 00	
		" " ditto help Sub-station	24 00	
		" " cash shortage, Sub-station C/B		216 16
		" " short on collections, Sub-station		168 35
Balances omitted to be brought from 1909 to 1910 or no bills rendered				831 17
Due from members of Commission, 1906, to 31st December, 1909				479 48
E. Smith, shortage as per list as explained fully in Sub-station balance				190 23
J. T. Brittick, ditto			$19 86	
"		less	3 00	
				16 86
W. Brittick, ditto				28
F. Flowers, ditto				1 20
		Total	$542 67	$1,903 73
		Since passed and paid	520 67	541 35
		Balance to collect	22 00	1,362 38
			$542 67	$1,903 73
		Total errors		$2,446 40

EDWD. C. DAVIES,
Auditor.

4th November, 1910.

GRAVENHURST PUBLIC SCHOOL BOARD.

Receipts.

		1908.	1909.
Balance from 1907-1908		$76 30	$148 75
Cash from 1907, levy 1908		100 00	207 10
" " 1908, " 1909		4,227 90	4,624 32
Grant, Provincial Legislature		465 00	242 00
Township of Muskoka, levy		.....	334 96
Legislature Grant, Teachers		.....	205 00
Cash in Bank	$69 96		
Unpaid cheques	93 00		
			23 04
		$5,069 20	$5,785 17

Payments.

Teachers salaries (including subs.)		$3,724 61	$3,848 40
Caretakers salaries		522 00	584 00
Secretary-Treasurer salaries		79 25	80 00
Fuel		309 76	413 98
Repairs		100 80	530 00
Furniture		.....	11 95
Insurance		18 49	45 50
Supplies, advertising, printing, etc.		165 54	96 34
Teachers' Bonuses, Legislature Grant		.....	175 00
Cash in Bank	$321 49		
" less unpaid cheques	172 74		
		148 75	
		$5,069 20	$5,785 17

EDWD. C. DAVIES,
Auditor.

Gravenhurst, August 26th, 1910.

GRAVENHURST HIGH SCHOOL BOARD.

Dr.	1908.	1909.
Balance on hand from 1907-1908	$33 12	$126 65
February.....Balance of 1907, payment, 1908	150 00	15 00
" .....Cash paid Treasurer	150 00	150 00
April 1..... " " "	225 00	350 00
March 1..... " " "	.....	450 00
June 1..... " " "	.....	400 00
Nov. 18..... " " "	435 00	.....
" 25..... " " "	65 00	.....
Dec. ..... " " "	10 00	305 00
" ..... " " "	550 00	.....
Total Gravenhurst Municipality	$1,618 12	$1,796 65
Government grant	1,329 34	1,356 60
Fees collected, McNab	531 25	249 25
" " Hobbs	.....	313 75
Proceeds of concert	.....	46 70
Total	$3,478 71	$3,762 95

Cr.		
Salaries, supplies, etc.	$3,352 06	$3,740 59
Balance, cash in Bank	$188 31	
Less unpaid cheques	61 66	
Balance to credit of Board account	126 65	22 36
	$3,478 71	$3,762 95

EDWD. C. DAVIES,
Auditor.

Gravenhurst, August 27th, 1910.

GRAVENHURST.

Assets as at 31st August, 1910.

Available.

Cash in bank			$2,772 24	
" on hand			831 59	
				$3,603 83
		Doubtful.		
Taxes uncollected, 1905-1906	$1,156 76	$88 65	1,068 11	
" " 1907	151 83	11 70	141 13	
" " 1908	1,378 66	13 50	1,365 16	
" " 1909	2,057 00	9 00	2,048 00	
" " 1910	8,672 78	.....	8,672 78	
				13,295 18
Due from Electric Light Commission			1,629 09	
" " Water Works "			856 60	
				2,485 69
Clark Factory in process of sale			5,500 00	5,500 00
Electric Current accounts, 5%			1,752 80	
Water Works accounts, 5%			226 18	
				1,978 98
Total available assets				$26,863 68

Fixed Assets.

Town Hall, Opera House, Town Cerk's Office, Band Stand, Market	$8,450 00
Fire Hall, Lock-up and Residence	3,125 00
Fire Hall Equipments	3,500 00
Library, Books and Fittings	775 00
Power House and plant therein	14,000 00
Pump house and machinery	4,700 00

Schools, High	$10,000 00		
" Central	5,000 00		
" North	900 00		
" West	700 00		
" Old school site	225 00		
		16,925 00	
Hess Factory		1,300 00	
Cemetery		1,400 00	
Band Stand, Gull Lake		50 00	
" Instruments and Equipments, with uniforms, etc.		450 00	
Tower Team and Equipments		625 00	
" Weighing Machine		150 00	
Electric Light Transformers		4,000 00	
" " Lightning Arresters		200 00	
" Wires and Poles on Streets		20,000 00	
" Halfway House		50 00	
" Substation and Contents		4,250 00	83,945 00
Total			$110,808 68

EDWD. C. DAVIES,
Auditor.

Gravenhurst, September 6, 1910.

The Assets of $110,808.68 are covered by deferred payments on Debentures amounting to some $150,000.00.

Current.

Debentures and Interest Coupons accruing and payable this year to 31st December		$6,214 50	
A. Sloan, Arrears of Salary (See Statement)		365 00	
W. H. Cross, Arrears of Salary (See Statement)		306 64	
General Accounts Payable		457 93	$7,344 07
Dominion Bank, Floating Debt—			
Due on Notes, Dec. 31, 1909	$6,600 00		
On which was paid to August 31	3,591 00		
Leaving due	$3,009 00		
Owing on 1910 Notes	$4,300 00	7,309 00	7,309 00
Of this amount the Commission has to pay—			
Principal	$784 00		
Interest	2,518 25		
Principal, Interest and Sinking Funds on Debentures	$3,302 25		
			$14,635 07

NOTE.—I have taken in these Debentures to the close of the year, as the balance of Taxes on the 1910 Assessment is included in the Assets.

EDWD. C. DAVIES,
Auditor.

Gravenhurst, September 6, 1910.

INSURANCE AND GUARANTEE BONDS.

Insurance.

Town Hall and Opera House Clerk's Office, Band Stand, Market and Weigh Scales	$6,650 00
Fire Hall, Lockup and Residence	2,500 00
" Fire Engine	None
Library Books and Fittings	600 00
Power House and Electric Plant therein	None

Schools, High	5,000 00
" Central	6,000 00
" North	870 00
" West	500 00
Clark Factory	8,000 00
Hess Factory and Machinery	1,650 00
Band Stand, Gull Lake	None
" Instruments, Uniforms and Equipments	None
Tower Team and Equipments	None
Pump House and Machinery	3,500 00
Substation and Contents	2,500 00

Guarantee Bonds.

Town Clerk and Treasurer, W. H. Cross	$4,000 00
Electric Light and Power Treasurer, H. S. Shannon	2,000 00
Public School Bond, R. R. Stanley	1,000 00
*F. S. Grant, Collector of Taxes	.....
*High School Bond, L. Edwards	.....

*Now being negotiated with a Guarantee and Accident Company.

EDWD. C. DAVIES,
Auditor.

Gravenhurst, September 5, 1910.

EXPLANATION OF MR. CROSS' "BALANCE ON HAND," AUGUST 31, 1910.

Sheet No. 30, Balance shown as on hand	$831 59	
Cheques outstanding in hand and waiting to be countersigned by Mayor		$331 43
		26 20
Government Allowance on Births, Marriages and Deaths, Paid Vouchers held as Cash, waiting for convenient time to clear up		62 66
Boy helping with Substation Books, paid by Mr. Cross, who has not yet been reimbursed		24 00
Account Submitted by Mr. Cross for Salary overdue, $523.81; on checking, reduced this to $306.64, which he accepts as amount overdue (Statement attached)		306 64
Estimated amount due him on Tax Sales at 2 per cent. on sum realized—no account yet rendered		75 00
Petty Disbursements, Stamps, etc., 1909		15 00
Cash produced on hand		70 45
On this showing there is a balance due Mr. Cross of $9.34, over cash on hand	79 79	
	$911 38	$911 38

EDWD. C. DAVIES,
Auditor.

Gravenhurst, September 3, 1910.

SOUTH FALLS, POWER ACCOUNT.

Feb. 4.	Loan Dominion Bank	$8,000 00	
" 5.	" " "	2,000 00	
" 17.	" " "	14,400 00	
" 22.	" " "	2,000 00	
" 25.	" " "	1,500 00	
" 29.	" " "	2,100 00	30,000 00
March 7.	" " "	8,000 00	
" 9.	" " "	2,000 00	
" 20.	" " "	14,000 00	
" 24.	" " "	2,500 00	
" 25.	" " "	2,000 00	
" 28.	" " "	1,500 00	30,400 00

April	1.	Loan Dominion Bank	2,100 00	
"	10.	" " "	8,000 00	
"	11.	" " "	1,700 00	
"	13.	" " "	2,000 00	
"	23.	" " "	14,400 00	
"	23.	" " "	800 00	29,000 00
Dec.	31.	Dominion Bank Interest Rebate	54 20	54 20
				$89,454 20
Dec.	31.	Proceeds from Debentures	$41,330 62	
"	"	" add No. 1 coupon not realized	677 31	
"	"	" add No. 2 coupon not realized	711 18	
"	"	" add Errors	1 25	
"	"	" add Interest accrued	5 97	$42,726 33
				$132,180 53
Jan. 1, 1908.		Bank Overdraft		$205 50
		Bills Payable	$119,400 00	
		Interest	2,010 51	
		Corporation General Account	1,450 00	125,360 00
		L. J. Falstrom	1,000 00	
		Jenckes Machine Co.	800 00	
		Ailis, Chalmers & Bullock Co.	2,405 82	
		Canda Foundry	2,000 00	6,205 82
		Debentures 1 and 2 Contra	1,388 49	
		Printing Debentures	80 00	
		Law Costs	50 00	1,518 49
				$130 584 82
December 31.		Balance in Bank		1,390 21
				$132,180 53
1909.		Bank Balance Brought Forward		$1,390 21
Jan. 2.		Corporation General Account	$187 57	$187 57
Mar. 18.		Debentures	15,011 25	15,011 25
1910.				$16,589 03
Jan. 1.		Balance Cash in Bank		$716 57
1910.				
July 31.		Balance Cash in Bank		$634 50

Covering period May, 1907, to July 31, 1910.

EDWD. C. DAVIES,

Gravenhurst, August 11, 1910. *Auditor.*

1909.	Interest	$183 66	
	Labour	98 50	
	Law Costs	541 93	
	Corporation General Account	5,208 69	
	Printing and Advertising	4 78	
	Telephone	55	$6,038 11
	W. N. Beall	1,174 90	
	L. Falstrom	2,961 00	
	Muskoka River Improvement Co.	425 00	
	W. N. Moody, Land Purchase *re* Pole Line	125 88	
	Mowry & Son	494 47	
	Etler & Clift	973 42	
	Hamilton Bridge Co.	365 00	
	Canada Foundry Co.	3,156 11	9,675 78
	E. W. Gowme, Painting (F. Seater, $105.00)	126 05	
	F. Child, Sub-station in full	32 52	158 57
			$15,872 46
	Balance Cash in Bank		716 57
			$16,589 03

1910. Law Costs	$48 07	
Hill Bros.' Livery	34 00	$82 07
Balance Cash in Bank		634 50
		$716 57

Covering period May, 1907, to July 31st, 1910.

EDWD. C. DAVIES,
Auditor.

Gravenhurst August 11, 1910.

SUMMARY, SOUTH FALLS—POWER ACCOUNT DISBURSEMENTS.

	Total.	1907.	1908	1909 and 1910.
	$ c.	$ c.	$ c.	$ c.
Butler & Swift	2,423 42	1,450 00	.....	973 42
W. M. Beall	6,627 28	5,452 38	.....	1,174 90
L. Falstrom	9,452 82	5,491 82	1,000 00	2,961 00
Jenckes Machine Co.	3,742 86	2,942 86	800 00	.....
Allis, Chalmers, Bullock Co.	7,330 82	4,925 00	2,405 82	.....
Canada Foundry Co.	6,756 11	1,600 00	2,000 00	3,156 11
Hamilton Bridge Co.	365 00	.....	.....	365 00
Deed of Land, Thos. H. Somers	400 00	400 00	.....	.....
Muskoka Land Improvement Co.	425 00	.....	.....	425 00
W. A. Moody, purchase *re* Pole Line	125 88	.....	.....	125 88
Mowry & Son	494 47	.....	.....	494 47
Interest	3,100 72	906 55	2,010 51	183 66
Law Costs (1910, $48.07)	670 00	30 00	50 00	590 00
T. T. Simpson, Engineer	500 00	500 00	.....	.....
W. Clift, Inspector	86 25	86 25	.....	.....
Labour	896 61	798 11	.....	98 50
Freight and Handling	60 39	60 39	.....	.....
Stationery and Printing Debentures	84 78	.....	80 00	4 78
Hill Bros., Livery ($34.00, 1910) and Sundries (55c.)	34 55	.....	.....	34 55
E. W. Gomenc, F. Slater ($105.05)	126 05	.....	.....	126 05
F. Child, Substation in full	32 52	.....	.....	32 52
Bills Payable	180,100 00	60,700 00	119,400 00	.....
Corporation General Account	12,627 94	5,969 25	1,450 00	5,208 69
Debentures 1 and 2	1,388 49	1,388 49	.....	.....
	237,851 96	91,312 61	130,584 82	15,954 53
July 31, 1910. Bal. Cash in Bank	634 50	.....	.....	.....
	$238,486 46	.....	.....	.....
Loans and Advances	180,748 88	91,107 11	89,454 20	187 59
Debentures	57,737 58	.....	42,726 33	15,011 25
	$238,486 40	91 107 11	132,180 53	15,198 82

EDWD. C. DAVIES,
Auditor.

Gravenhurst, 11th August, 1910.

SOUTH FALLS, POWER ACCOUNT.

1907.			Dr.	
May	30.	Loan Dominion Bank	$3,000 00	$3,000 00
June	5.	" " "	2,000 00	
"	15.	" " "	1,500 00	
"	27.	" " "	1,500 00	5,000 00
July	10.	" " "	2,000 00	
"	12.	" " "	1,500 00	
"	15.	" " "	6,400 00	
"	25.	Loan Electric Light Commissioners	100 00	10,000 00
August	2.	Loan Dominion Bank	3,000 00	
"	19.	" " "	1,000 00	
"	27.	" " "	1,000 00	5,000 00
Sept.	6.	" " "	14,400 00	
"	13.	" " "	2,000 00	
"	16.	" " "	1,500 00	
"	30.	" " "	2,000 00	19,900 00
Oct.	10.	" " "	14,400 00	
"	16.	" " "	2,000 00	
"	19.	" " "	1,500 00	17,900 00
Nov.	1.	" " "	8,000 00	
"	2.	" " "	2,000 00	
"	14.	" " "	14,400 00	
"	19.	" " "	2,000 00	
"	22.	" " "	1,500 00	
"	26.	" " "	2,100 00	30,000 00
Dec.	2.	Gravenhurst Corporation General Account Loan	307 11	307 11
				$91,107 11
		Balance, Bank Overdraft		205 50
				$91,312.61

SOUTH FALLS, POWER ACCOUNT.

1907.			
	Bills Payable	$60,700 00	
	Interest	906 55	
	Corporation General Account	5,969 25	$67,575 80
	Etler & Clift	1,450 00	
	Wm. Beall	5,452 38	
	L. F. Falstrom	5,491 82	12,394 20
	Jenckes Machine Co.	2,942 86	
	Allis, Chalmers & Bullock Co.	4,925 00	
	Canada Foundry	1,600 00	9,467 86
	T. T. Simpson, Engineer	500 00	
	Labour	798 11	
	William Clift, Inspector	86 25	
	Law Costs	30 00	
	Freight and Handling	60 39	1,474 75
	Deed of Land, Thos. H. Somers	400 00	400 00
			$91,312 61

To the Mayor and Council of the Town of Perth:

GENTLEMEN,— Under authority of an Order-in-Council, approved by His Honour the Lieutenant-Governor, the 20th day of September, 1910, in accordance with instructions from the Provincial Municipal Auditor, I have made an inspection, examination and audit of the books, accounts, vouchers and moneys of the Town of Perth, in the County of Lanark and beg herewith to submit my report.

This audit has been made upon the request of a number of ratepayers addressed to His Honour The Lieutenant-Governor.

The petition assigns the following reasons that such examination be conducted:

(1) Sewer, granolithic and current account had been so mixed that no ordinary accountant can trace where the money has gone to.

(2) Money had been paid out for the construction of sewers, and cheques payable to bearer and not to order.

(3) The Hydrant rates of the Town have been levied and collected, but the Company have not received payment, and no satisfactory account has been given of the money.

(4) Public documents sent to the Council have been suppressed by the Clerk or his colleagues and not read before the Council.

This petition bears the signatures of I. S. McCullough, S. I. Bennett, David Maybee, Councillors, and 46 ratepayers.

Being desirous of obtaining the views of the various ratepayers and grounds of complaint as contained in petition presented, I accordingly interviewed a number of those whose names appeared to ascertain, if possible, any specific charges they might prefer. In conjunction with those I also made enquiries from various quarters but little could be gathered which would enable me to form any definite opinion for grounds of complaint other than those as preferred or outlined in the petition.

The scope of the audit as per Order-in-Council was to make an inspection, examination and audit covering the period subsequent to the year 1902.

On beginning same, covering period mentioned, I found this to be impracticable, as the necessary vouchers, orders, and other important documents were missing or destroyed and as no satisfactory explanation could be given by the Treasurer or Clerk to account for their disappearance, the scope of my investigation is necessarily limited to the period 1904-1910.

I will now proceed to report findings on complaints as mentioned.

(1) Sewers, granolithic and current accounts had been so mixed that no ordinary accountant can trace where the money has gone to.

Unquestionably there is good ground for complaint as to the manner in which the bookkeeping has been conducted. This, however, refers more particularly to the transferring of large sums of the Town's moneys from one account to another as occasion required, and apparently in several cases without regard to the law nor with the sanction of Council. I find in looking into the matter most carefully, that this had been the practice. I therefore think it incumbent on me that the attention of the general ratepayers should be called to such objectionable methods.

"$8,000 TRANSFER FROM SEWERAGE TO GENERAL ACCOUNT."

On investigating the circumstances in connection with this transfer I found the facts to be:

In July, 1909, the "General Account" was overdrawn to the extent of $7,927.89, whereas the "Sewerage Account" showed a large credit balance. On

31st July a cheque was drawn on Sewerage Account (on ordinary counter form) payable: "Transfer to General Account or Bearer, eight thousand dollars ($8,000.00)." This cheque was signed by the Mayor and countersigned by the Treasurer. On going carefully over the minutes I have been unable to find any authorization by resolution of Council for such payment, which was apparently carried through on the sole responsibility of the Mayor and Treasurer. The money thus transferred remained in General Account for several months. On the 24th November the Provincial Auditor made an examination of the Teasurer's book, when his attention was called to the fact of $8,000 having been transferred from "Sewerage" to "General" account. It was then pointed out that such was contrary to law, but was assured by the Treasurer that the amount would be refunded when taxes were paid in December.

In connection with this matter the Provincial Auditor addressed a letter to "The Mayor and Council of the Town of Perth," in which he said in part: "One of the leading principals of the Municipal law is that moneys raised for a special purpose must not be diverted to any other purpose. I need scarcely say that the transfer of this sum of $8,000 is therefore contrary to law. I could not find any authority had been furnished to the Treasurer from time to time for orders accepted by him. If this be the practice in your municipality, it is a most objectionable one. The Treasurer is the custodian of all moneys belonging to the Corporation, and before accepting an order or making a payment, it is his duty to see that the payment is proper and authorized by law, by-law or resolution of Council. An order signed by the Mayor and Clerk, if not duly authorized by Council, will not release the Treasurer from his liability for any improper payment. See 290, C. M. A., 1903."

Although this letter is addressed to the Mayor and Council it appears to have been either suppressed or withheld from Council. The following appears in minutes: "From I. W. Sharpe, Provincial Municipal Auditor, that he had made an examination of the Treasurer's books and called Council's attention to the item of $8,000 transferred from Sewerage to General Account, and such transfer was not in accordance with statute and that same must be repaid. It is the duty of the Treasurer to see that all payments are proper and authorized by law, by-law or resolution of Council." Then follows a note: "Entered erroneously but not read." This letter remained evidently pigeonholed until 8th August, 1910, when it was read before Council and again appeared in Minutes of that date. On 22nd December, by resolution of Council, it was ordered that the sum of $8,000 be transferred from General to Sewerage account, which was accordingly done by cheque (on counter form) dated 22nd December, 1909, "Pay Sewerage account, Town of Perth, eight thousand dollars, refund of transfer to Town account, signed John Code, Treasurer, Town of Perth," thus closing the transaction. I have been unable to find that any interest had been allowed sewerage account for this accommodation, which it certainly is entitled to. No doubt the motives which actuated the transfer of this sum were done with the best of intentions, and supposedly in the Town's interest, but it would be well for officials in the future before incurring such liability that same be in accordance with the statute.

It likewise came to my notice that further sums had been treated in a similar manner, or charged against account other than directed.

On 8th July, 1907, the following resolution was passed in Council: "On motion of Messrs. Grant and Foy the Clerk was authorized to issue cheques chargeable to sewerage account in favor of parties named on sewer pay rolls of June 24th and July 6th."

At this period the sewerage account was carried at the Sovereign Bank, whereas the general was held by the Merchant's Bank. In checking sewerage cash book, I was unable to trace cheques specified and as authorized to be paid in accordance with above resolution. On further investigation I found in the municipal cash book a column bearing the heading "Sewerage account," and the cheques appearing on pay rolls mentioned charged against "General Account" in Merchants Bank. Numerous cheques drawn during following months in connection with such work were treated in the same irregular manner and contrary to resolution of Council.

The following amounts (totals) were so charged, July to November:—

July, $556.73; August, $710.65; September, $257.84; October, $84.74; November, $50.31; total $1,660.27.

On 27th December the following resolution was passed in Council: —

"Upon motion of Messrs. Grant and Foy the sum of $1,710.02 was ordered to be transferred from Sewerage account and placed to credit of General account, the said sum being the aggregate amount of cheques issued on General account and properly chargeable to sewerage account."

"Further it was ordered that the sum of $166.70 be transferred from granolithic account and placed to the credit of general account, the said sum being aggregate of cheques paid out of general account and properly chargeable to granolithic account, and the further sum of $186.04 was ordered to be transferred from granolithic account to close out same and placed to credit of general account."

From the above it will be seen the total amount in the first instance improperly charged against General Account was $1,660.27, whereas the sum ordered to be refunded was $1,710.02, an excess of $49.75, which neither the Clerk nor Treasurer were able to properly explain otherwise than "It might be interest."

I was unable to find any resolution of Council authorizing payment of cheques appearing on the various rolls during the months mentioned, other than that they be charged "Sewerage Account" and were so stamped on face of each cheque. Notwithstanding this direction they were charged against General Account in the Merchants Bank, thus contrary to resolution of Council. I cannot understand how this could have been accomplished other than through instructions from the Town officials.

The amount transferred from Granolithic to General Account, $166.70, is in the same category and was composed of a number of small cheques improperly charged and subsequently refunded. Nor can I see why it should have been ordered that the sum of $186.04 be transferred from Granolithic to General Account. This money should have remained where it properly belonged, as the account is still open.

The shifting and transferring large sums of the Town's moneys from one account to the other and at pleasure refunding same is wrong, and in direct contravention of the Municipal Act. Likewise when resolutions of Council are passed directing payments against specified accounts, cheques so issued in accordance with such resolution cannot be charged against any account other than as designated. This, however, has been done. The practice, to put it mildly, is most reprehensible. I am not prepared to say that the Council were aware of this, nor was it done to deceive, but such procedure invites irregularities in other quarters.

The Town officials appear to have overlooked the Act, which is most explicit on this point, "that moneys raised for a special purpose cannot be diverted to another purpose," and if such improper payments are made they mean personal responsibility.

There were a number of minor irregularities, but only those of importance are referred to in this report.

Money had been paid out for construction of sewers with cheques payable to bearer and not to order.

In going over cheques issued in connection with sewer construction, to which allusion has been made, covering the period 1904-1909, I found that during the years 1904-5-6 about 70 per cent. were thus drawn, payable to bearer, and as a general rule, this being the case, unindorsed. Consequently, the town is placed in the position of having absolutely no receipt for the large sums thus paid out during the years mentioned.

I may state that during this period sewer account was carried with the Sovereign Bank, and I think it would have been well had their representative called the Treasurer or Clerk's attention to such an objectionable method. Latterly, however, I was pleased to note that this practice had been largely discontinued and cheques properly drawn.

No harm resulted, and I am quite satisfied the mistake, as it undoubtedly was, was unintentional. However, for the Council's future guidance I would suggest that no cheques drawn, no matter what the amount or who the payee, be otherwise than to order. It would be a simple matter for persons unable to endorse pay cheques to make their mark and have same witnessed. This would place the town in possession of a proper receipt, and thus avoid all questions of payment which might at any time arise.

Hydrant Rentals.

In regard to this important matter, it appears that an agreement was entered into between the Town and the Canadian Electric Power Company, by which the latter should inaugurate a proper and adequate system of Hydrants of sufficient pressure or power satisfactory to the Town, and which in case (should necessity arise) be able to cope against the possibility of any serious conflagration. The system was accordingly inaugurated, but the Town claims that the Company has fallen short, or not lived up to their contract, the pressure supplied being altogether insufficient for the purposes required, and also the plant not being equipped in compliance with the agreement.

Previous to 1905 several rentals had been paid, but in consequence of the Company's failure to carry out the terms as specified in their contract, the Council in 1905 entered a protest, and refused further to pay the amount of rental, each subsequent Council taking the same position, with the result that the Company, through its Solicitor, entered action against the Town for five years' back rental of $1,000 per annum; the matter is still in litigation, all efforts to arrive at a settlement having failed. Notwithstanding the position of affairs of which the Council were well aware, they still continued to assess the ratepayers and collected from them $1,000 annually during the years 1905-6 or a total of $2,000. On following my investigation I found that the money so collected instead of being placed in the bank to credit of a "contingent" or "suspense" account, which undoubtedly was the proper course to follow, until such time as a settlement could be effected or litigation removed, was used for ordinary expenditure, thus placing the Town in a very awkward position as, even granting that they be successful in their suit, in my opinion would by no means relieve them of a certain liability amounting to at least several thousand dollars which the ratepayers will be called upon to face.

Another course open for the Council to have followed would have been a continuation of the assessment, placing the moneys so collected to credit of account suggested, where it would have accumulated with interest until such time, pending the result of the present suit.

Public Library.

I have carefully examined the books and vouchers in connection with the Public Library. The Treasurer's books I found to be in good order, and have been regularly audited and balanced, and with a few unimportant exceptions which were rectified under my examination, found correct. The checks I found to be in regular order, the payee's name appearing on back in almost every case.

I submit summary of receipts and disbursements for the year 1909, and corrected statement to 31st October, 1910, showing a balance on hand at that date as per bank pass book, of $313.14.

A very complete and simple system and well suited to the use of libraries is the combined cash book, journal and ledger. This method of keeping the accounts I found in frequent use and much appreciated by several municipalities throughout Ontario. Should the Council so desire, I will be pleased to submit a form for the Treasurer's guidance. The Treasurer I found a very capable and conscientious official and well fitted for the position he occupies.

Bank Account.

At present the General and Sewerage Accounts are carried at the Merchants Bank. Previous to November, 1907, the Sewerage Account was held by the Sovereign Bank; Public Schools, Collegiate Institute and Separate School accounts with Merchants Bank, the Bank of Ottawa holding the County of Lanark.

I have compared the balances as shown in Treasurer's cash books (General and Sewerage) with bank pass books, month by month, covering period 1904-9 and found same to correspond.

On examination of the General Account it came to my notice that the Town Grants to the various School Boards and County, drawn from the General Account, have been so done merely on ordinary counter cheques signed "John Code, Treasurer, Town of Perth." These payments came under statutory enactment and are authorized by by-law upon proper requisition, but I must take exception to the practice of moneys being paid over merely on the signature of the Treasurer.

During the period covered by this audit, I found the aggregate sum so paid over to the various boards:

Public Schools, Collegiate Institute and Separate Schools..	$57,754.99
County of Lanark	13,386.42
	$71,141.41

Coming to the retirement of Debentures and coupons I found during same period that these had been taken up by the Treasurer with cheques drawn in a similar manner and represented the sum of $62,134.59.

This long-standing practice of withdrawing and transferring, in some cases without authority, large sums of the Town's moneys is wrong, and should be discontinued forthwith. No payments, whether fixed or authorized, should be made

except upon the signatures of the Clerk and countersignature of the Treasurer or such officials as may be designated by the Council to so act, and the bank notified to that effect. No other than the Town's official cheque should be permitted to be used; by the present method now in vogue the Clerk has absolutely no record of such cheques having been issued, until their appearance in the bank pass book at end of the month.

From a banking standpoint and looking at the safeguarding of the Town's funds, it appears to me incomprehensible that such practice should have continued for such a length of time. Nothing is to be gained, nor can I see why the Treasurer should take upon himself a personal responsibility when there is absolutely no necessity for his assuming such.

I trust the Council will give this most important matter due consideration.

Municipal Cash Book.

The Treasurer's Cash Book is well and carefully written up, the receipts and payments being distinctly entered, and the vouchers I found to be in fairly good order, with the exception of a number of cash receipts which I was unable to check against their original source owing to the absence of vouchers. No matter how moneys are received by the Treasurer, by cheque or otherwise, an official form of receipt with stub properly numbered should be used, and the moneys received from whatever source should be acknowledged thereon. A more objectionable feature, however, is the dumping wholesale of numerous items into "Miscellaneous" when a question as to their proper disposal should arise. This should not be, as it is the duty of members of finance committee to discriminate, and direct more carefully the correct amount chargeable. The Town's Accounts are kept in the Cash book only, neither Journal nor Ledger being used. Proper books of account should be opened forthwith, and the Council should insist upon them being properly kept. The Treasurer is quite competent if only he be furnished with the proper information to enable him to keep the accounts. Should the Council desire to carry out my views as suggested, no doubt satisfactory arrangements could be made with someone whose expert assistance is necessary to carry the several accounts into the Ledger from the books of account as now kept by the Clerk and Treasurer, so that under the covers of this book properly kept, the standing of any account can be ascertained at a glance.

Debenture Register.

This most important record I found to be very incomplete, particulars as to amount of Debenture, years to run, date payable, when sold and to whom being in several instances entirely omitted, while in others partially so. Previous to 1889 no register appears to have been kept. The following I found incomplete:—

684, $11,000. No particulars given as to when debentures were delivered or to whom sold, nor amount realized.

869, $12,155. No date given when delivered, nor amount realized.

870, $5,030. No date given when delivered, nor amount realized.

897, $30,000. No date given when delivered, nor amount realized.

921, $12,000. No date given when delivered, nor amount realized.

Latterly, however, I noted that this had been rectified.

Redemption and Cancellation of Debentures and Coupons.

As previously referred to in Bank account Debentures and Coupons held by various banks had been taken up by the Treasurer. The safe-keeping of such securities so redeemed was, I regret to say, sadly neglected. Upon examination and checking these with the Cash Book I was much surprised to find that in almost every instance neither Debenture or Coupons had been cancelled, nor was the ordinary precaution of keeping such vouchers in a place of safety followed, they being merely dumped along with other documents into paper boxes and these left in open office, and it was only when I drew attention to such a dangerous practice that the officials realized what the consequences might have been. Debentures and Coupons are payable to *Bearer* and represent *so much cash* and had these in their uncancelled state fallen into dishonest hands the Town could undoubtedly have been compelled to pay them a second time to an innocent holder.

I cannot impress too strongly upon Council the necessity of directing that in future, upon redemption of Debentures and Coupons, the same be properly cancelled and filed away in a place of safety and in such manner as to be readily accessible for future reference should occasion arise.

Sewerage Account.

There is no account coming under Municipal administration which has been the cause of so much trouble and Council bickerings than that falling under the head of Drainage. At the same time, with ordinary care and proper methods, there is no good or valid reason why such difficulties should arise.

During the course of my investigation, I found this to be one of the chief bones of contention amongst members of the Council. From a careful study of the matter there was good reason for criticism as to the manner in which the account has been dealt with; one account only has been used, viz., "Sewerage Account," to cover all.

No ledger or register of any kind is kept showing cost of construction of each individual drain, except in a very indefinite manner by estimates as furnished by engineer. This should not be in treating with such works. When engineer's estimates are submitted and approved by Council, by-law should be passed authorizing the borrowing from the bank the sum necessary to cover cost of work; attached to same should be schedule and declaration signed by the Clerk that the money so to be borrowed is to be used for that and no other purpose.

During the progress of the work or works each drain should be charged in a "Local Improvement Register" with all payments in connection with construction of same and credited with all moneys that may be received—when works are completed debentures can then be issued to cover the exact cost. By following this method a complete record is thus kept and the standing of each drain account can be ascertained at any time.

Several matters in connection with the manner in which Sewerage account has been administered came before me, some of which are referred to elsewhere, but one in particular I should like to bring to the notice of the Council, which

in my opinion is worthy of the severest criticism, viz., the sale in 1909 of Sewerage debentures, realizing, $27,356.03 and were composed of:

Debenture 1083	$ 5,075 86
Debenture 1084	1,815 07
Debenture 1085	18,587 82
	$25,478 75

At that particular time the Sewerage Account carried with the Merchants Bank was overdrawn between $8,000 and $9,000 dollars only; why then the necessity of issuing debentures to such an extent. One of the above debentures No. 1085, $18,587.82, I should like to draw special attention to. By-laws Nos. 1083 and 1084 specify work constructed, with schedules of same attached. No. 1085 reads "Certain sewers were constructed in 1908 and the Town's share of the cost thereof is $18,587.82." According to this by-law no mention is made of the work so constructed nor schedule covering same, attached. If such sewers were constructed and debentures were sold for the purpose of covering the cost thereof, it seems to me a strange coincidence that the money thus raised for the specified purpose as contained in said by-law has remained practically idle in the bank ever since (July, 1909).

To me there appears to be no excuse for such foolish "high financing" on the part of those responsible, especially when it was clearly apparent that such was altogether unnecessary. The town is loser to the extent of several hundred dollars in interest annually, debenture debt is increased by that amount, and ratepayers are likewise called upon to face an annual payment of principal and interest of $1,209.17, equal to about one mill, which partially explains the increased rate in 1910.

It is contended by some members of the Council that the borrowing of the money was good financing, considering the easy state of the money market at that time. I cannot, however, see how such contention can hold good, as such borrowing has proven to have been unnecessary, the burden of which falls upon the ratepayers.

Tax Rate.

There appears to be a general feeling of dissatisfaction as to increase in the tax rate which continues to mount year by year and has now reached (1910) 27.5/10 mills or some 3-1/2 mills over that of 1909.

For the past seven years the rate stood:

1904,	21 6/10
1905,	23 7/10
1906	23 4/10
1907,	23 4/10 with R.C.S. rate.
1908,	24 2/10
1909,	24 9/10
1910,	27 5/10

A partial explanation for such increase is the large addition to the Town's Debenture indebtedness, which during the past six years has risen from $65,903, in 1904 to $201,553 in 1909. This, however, it must be remembered has been brought

about by the extension of the Sewerage System, Granolithic walks, Bonus to the Wampole Company and purchase of the Electric Light Plant, by which the ratepayers have directly and indirectly received good value.

The jump to 27-1/2 mills in 1910 or some 3-1/2 mills in excess of 1909 is explained by the deficit carried over from previous year $2,041.63 increase, also in school requisitions and a few items of expenditure out of the ordinary. If this is the only ground for such an increase, it appears to be rather a lame one. Surely if such expenditure was merely of a "temporary character," some curtailment could have been practised in other quarters to meet same than adding to the already heavy burden of the taxpayers.

I should, however, like to call the attention of Council to the fact that this increase has to some extent been brought about by the *unnecessary* issue of Debentures in 1909, supposedly for sewerage construction. These funds so obtained are, or a considerable portion, lying in the Bank idle, the annual levy for such privilege falling upon the heads of the ratepayers. Further reference to this will be found in another portion of my report.

Increase in Debenture debt since 1904.

1904, ...	65,903	Increase
1905	73,584	7,681
1906, ...	91,141	17,557
1907, ...	160,411	69,270
1908, ...	175,428	15,017
1909, ...	201,553	26,125
Increase		$135,650.

The increase alone is thus more than double the entire Debenture indebtedness in 1904.

Tax Moneys.

It has evidently been the usual custom for years that tax moneys collected by the Collector have been deposited in his own name in a chartered bank, and from time to time handed over to the Treasurer. It appears to me that by following this method a great deal of unnecessary work and responsibility in making such collections is placed upon the collector's shoulders. This could be obviated if the Council would avail themselves of Section 40, Chap. 7, R.S.O., 1897, which states:

"The Council of any municipality may, by by-law, direct that moneys payable to the municipality for taxes or rates and upon such other accounts as may be mentioned in the by-law shall be, by the Collector of Taxes or by the person charged with the payment thereof, paid into such chartered Bank as the Council may by such by-law direct, to the credit of the Treasurer of the municipality; and in such case the person making payment shall obtain a receipt from the bank thereof, and produce the same to the municipal Treasurer, who shall make the proper entries therefor in the books of the municipality."

To my knowledge this system is at present in operation in a number of cities and towns throughout the Province, the advantages of which must be apparent.

The moneys thus paid in going direct to the Town's Credit at close of each day (in total) the stubs being handed to the proper Town Official, who then proceeds to make the necessary entries. The work would then be one of mere book-keeping and reduce to a minimum the handling of the Town's money by the Collectors, and likewise obviate the retention, as at present, of large sums in the Collector's hands on which interest is thus lost, besides safe-guarding the funds.

If Council see fit to consider my suggestion, I give for their guidance formula which could be adopted.

TOWN OF PERTH.

"Taxes payable at the Merchants Bank, Perth, as follows—on any business day after receipt of this notice between the hours of a.m. and p.m."

This could be either embodied in Tax Bill or stamped across face of same.

No taxes however, would be accepted by Bank after expiration of time limit, as they would then come under arrears and subject to 5 per cent. additional.

Tax Collections.

These collections which represent the most important part of the Town's income were duly examined, and I found the settlements between the Collector and Treasurer fully recorded.

Collectors' and Assessment Rolls.

The Assessments rolls were carefully compared with the collectors' and with the exception of one or two unimportant items hereinafter related found in excellent order.

In very few instances, however, could I find the assessors' affidavit in verification of his roll attached, and in a number of cases the individual columns of his roll not added.

Items Referred to Above.

No. 6, West Ward:				
William Orr.	Assessment Roll			$1,450 00
	Collector's Roll shows			1,250 00
	Difference			$200 00
	Amount collected	$27.00		
	Should be	32 30	$5 30	
No. 73, West Ward:				
John Berhangette.	Assessment Roll			$950 00
	Collector's Roll shows			700 00
	Difference			$250 00
	Amount collected	$15 12		
	Should be	20 50	$5 38	
	Short		$10 68	

Collegiate Institute.

The Cash Book was well kept and all town grants properly accounted for with the exception of $700, which appears under date of May, 1906, viz.: "Town of Perth from Special School debenture account Merchants Bank." For some time I was unable to trace what this represented, nor could I find a corresponding debit in the Town's Cash Book. It, however, came to my knowledge that a new account had been opened in the Bank under the title of "Town of Perth Special School Account"and the above sum charged up on 26th May, 1906. This amount remained in the form of an overdraft until 31st December, 1907, when a credit entry for the same amount appears, thus closing it out. The money obtained was derived from sale of debenture 1025 (College) $1300, proceeds of which went to the Town's General Account $700, was transferred to the "Special School Debenture Account"; the balance going to the Institute's credit.

The above $700, was practically a loan from the Town to the College (against debenture 1025) but as far as I was able to learn, made without the proper authority being obtained.

No interest appears to have been charged for this advance, nor is it shown in statement of Town's Assets and Liabilities prepared by the Auditors, they being in ignorance of such account having been or was in existence.

In checking over the Pupils' Fees (Receipts) I found the following missing:—

From January 1st to June 30th, 1904, missing.
From January 1st to June 30th, 1906, missing.
From January 1st to Dec. 31st, 1908, all missing.

Electric Light.

The Perth Electric Light plant was acquired by the Town in 1904, the purchase price of same being $10,000; expenses, etc., in connection with same ran the figures up to $12,306.88, statement of which is submitted. To meet this Debentures to the extent of $12,000 were sold, realizing $11,855.20 and the balance charged against the town.

In preparing statement of Receipts and Expenditures 1904-9, I have been considerably hampered for lack of proper material to work upon, but submit statement, the figures having been taken as they appear in the town cash book. The receipts include store lighting (arc), rinks, and rent of saw-mill. Revenue derived from this source is, however, insignificant. To the receipts, however, I have added what I consider a more than liberal allowance for street lighting properly chargeable against the town of $2,000 per annum, plus town hall and library, $175.

To get at a proper basis of the value as an investment, I have added the yearly charge, principal and interest paid by the town, against debenture $12,000. After making such allowance to revenue and adding charge (Deb. and Int.) to expenditure, it will be found that since the acquisition of the property in 1904, total receipts have amounted to $16,222.33 and expenditure $17,024.96, resulting in a loss of $802.63.

Since plant was acquired, nothing whatever has been written off for depreciation. Had this been done, the loss would have been materially increased.

Wampole Bonus.

In 1905 negotiations were entered into with this Company looking to the establishment of their factory in the town under certain conditions, one of which was the granting of a bonus of $25,000. Accordingly in June, 1905, the views of the electors were taken, when a majority voted in favor of terms being accepted upon proper security being given, safe-guarding the town's interests.

In accordance with this, By-law 957 was passed, which required the execution of a Mortgage by Henry K. Wampole, A. I. Koch, and Samuel R. Campbell to the town, and an agreement was entered into fully setting forth terms and conditions of said Mortgage, the Mayor and Clerk being authorized to execute same on behalf of the town.

On 21st December, 1905, a demand note signed by the Mayor and Treasurer for $25,000 was given in favor of the Merchants Bank and placed to town's credit, and on 23rd of same month a cheque for the full amount was handed over to the Company, without, however, taking the precaution of having the Mortgage executed, thus placing the town in the position of having no security against the money thus paid over.

Shortly after this a disagreement arose, the town claiming that the terms as expressed in the agreement had not been carried out, and that matters had been grossly misrepresented by the Company's late Manager, M. Brick.

This state of affairs remained until July, 1906, when an arrangement was come to and by-law 990 passed authorizing the execution of a new Mortgage, in which was embodied terms by which the Company agreed to return $10,000, same to be in ten annual instalments of $1,000 each, but to be exempt from taxes (with the exception of school rates) until 1916, when the whole amount returnable would be paid off—this arrangement was accordingly carried through and Mortgage duly executed.

Debentures to cover bonus, however, remained unsold, and note for $25,000 given to Merchants Bank was not taken up. On 31st December, 1906, debenture No. 1, $1,847.50, matured and was applied towards reduction of above note, and on 31st December, 1907, debenture No. 2, $1,816.00, was likewise applied, reducing the amount to $21,336.50. Interest had, however, accumulated to the extent of $2,495.18, making a total of $23,831.68. On 31st December, 1907, general account was credited with proceeds of Wampole Debentures, and cheque for $23,831.68 drawn by Treasurer in favor of Merchants Bank was handed to them retiring note.

I do not think it necessary to enter further into details or explain terms which are fully set forth in mortgage now held by the town. This new arrangement is, however, in my opinion, a most advantageous one, the town benefiting to the extent of $10,000. The Company likewise becoming a most important rate-payer and its continued success can only increase its contributions and so further compensate for the money thus granted.

Town Hall Rentals.

In the matter of rents received on account of Town Hall I found that although considerable sums had been collected year by year and had passed through the hands of the Clerk, no attempt had been made of any kind to keep a proper record of the amounts, and could get but little information as to whether the various sums paid over to the Treasurer were correct. This, in my opinion is

totally foreign to all accepted ideas of the correct method of book-keeping. Each individual payment for rent should be at once entered in a book kept for that purpose, with dates and all needful particulars, and the entries in the Treasurer's cash book should agree with the receipts given by him to the Clerk.

Assets and Liabilities.

In examining the statement of Assets and Liabilities for the year 1909, you will observe I have included in the list of Assets the Granolithic Walks, $44,848.58, as they are without doubt entitled to be so classed, the annual reduction of the Debenture Liability running concurrently with the like reduction of such asset. Also the balance of $10,000.00, viz.: $6,000.00 returnable by the Wampole Company in yearly instalments of $1,000.00, this likewise being reduced annually as payments are made, and with the retirement of the Debentures.

On the other hand, I have deducted $3,000.00 from the Electric Light System plant, as I cannot see why the plant should be increased $3,000.00 over the original purchase price of $10,000.00, looking to the fact that no allowance has been made for depreciation.

Minute Book.

The Minute Book is well and carefully kept. The list of the bills to be submitted to council for approval were recorded in proper sequence, one line or more if necessary being given to each, which considerably assists the auditors when examining the Minute Book for authority for disbursements.

By-Laws.

These I found filed in a very indifferent manner, no ready reference being kept. All by-laws should be consecutively transcribed in a book to be used for that purpose, and properly indexed, so that at any time any necessary information required could be readily at hand. In all cases the by-laws should show the date when finally passed.

Bonds.

I have enquired into the securities given by the several officials and find same in order.

Auditors.

The detail of their work has been comparatively well done, as far as the mere clerical correctness is concerned, although, I think, in future it would be wise that their criticisms should be further extended.

Licenses.

The records of this Department are very imperfect, no proper system of registering licenses being kept, and, therefore, the proper checking of the work was practically impossible. It is requisite that a register for these be prepared

at an early date. In this should appear Licensee's name, occupation, date of payment and years so covered, also a reference to the entry appearing in the cash book. It is also the duty of the Clerk when issuing licenses, upon production to him by the payer of the Treasurer's Official Receipt for the sum required, to enter it in the register. This loose condition of affairs should be corrected at once by the adoption of the book referred to.

Dog Licenses.

Here, again, I noticed considerable differences year by year, and proper records and register is lacking, no one seemingly being able to state the sums handed in, records having been mislaid, (if such ever existed), and also unable to produce Treasurer's acknowledgement. For this year, however, I understand Chief of Police Griffith has the duty solely in hand, and what I saw of his work feel satisfied, his duties will be faithfully performed.

Police Accounts.

I find the accounts of the Police Court not in a very satisfactory condition, no proper cash book or record being kept by the Police Magistrate. I, however, obtained from him a statement of the fines paid to the Town Treasurer, the total for nearly six and one-half years being $640.25, the amount as shown in the Treasurer's cash book being in excess of this, of over $120.00.

Conclusion.

In concluding this report, I may add that I have felt very severely the responsibility thrown on me by this audit. No effort has been spared to arrive at the absolute facts relative to the various matters that have been brought to my notice during the rather trying investigation; as to the suggestions and recommendations I have made for your future guidance, I do not wish you to think that you are going to jump into a new system in a day or a week, it must be gradual, and later the benefit will thus be realized. I may further say that the Town is extremely fortunate in having so faithful an official as the present Treasurer, Mr. John Code, and although his methods and ideas of municipal accounting may not altogether be in accordance or in keeping with my views, has undoubtedly the town's interests at heart and would do nothing wilfully that might perhaps be the means of being detrimental to the interests of the town.

You are also fortunate in having such capable officials as John A. Kerr, Clerk, and Robert Jamieson, whose long and able services are well worthy of recognition.

The remuneration granted the officials, especially that of the Treasurer, is not at all commensurate in proportion to their duties, if such are to be properly performed, if the recommendations as contained in my report are to be carried out, entailing as it would more work. I think Council would do well in granting some reasonable increase to the present salaries, which would never be felt by the Town, but would imbue in the minds of the ratepayers more confidence by the increased accuracy of the accounts.

The attention of Council is called to Section 14, Chapter 228, R.S.O. 1897, which requires that the recommendations made in his report shall be carried into effect.

Should Council so desire, I shall be pleased to furnish such advice and assistance as will enable the town's officials to properly carry out the recommendations as contained in this report.

All of which is respectfully submitted,

A. P. Scott,
Official Auditor.

Toronto, 20th December, 1910.

Assets.

Active—		
Cash in Bank, Sewerage Account		$15,366 45
" " Granolithic Account		40
" " General Account		3,461 32
Arrears of Taxes		1,190 33
Available Assets		$20,018 50
Fixed—		
Town Hall Buildings, etc., and Furniture (including Market)		$20,000 00
Electric Light System, Plant, etc.		10,000 00
Fire Hall, Reel Houses and Apparatus		7,900 00
Public Library Furniture and Equipments		14,250 00
School Buildings and Equipments		44,075 00
Fairbanks Scales for Testing Cement		125 00
Street Equipments		740 00
Sewers Equipment, etc.		750 00
Passive—		
Granolithic Walks		44,848 58
Wampole Company		6,000 00
Perth Sewerage System		113,000 00
		$281,707 08

Current Assets.

Cash in Merchants Bank	$3,461 32	
Unpaid Taxes	1,190 33	
		$4,651 65
Current Liabilities, General Account	$6,693 28	
Current Assets, General Account	4,651 65	
Deficit, 1909	2,041 63	

Note.—The only liquid assets in this list as shown above is cash in Bank, $18,828.17, and arrears of Taxes amounting to $1,190.33=$20,018.50.

Liabilities.

Bonded—			
Debentures, Local Improvements—			
Granolithic Walks			$44,848 58
Sewerage			118,607 00
Debentures, General—			
Electric Light			10,700 00
Gemmell			1,700 00
Wampole Company			22,400 00
Public Library			1,295 53
Collegiate Institute			817 71
Public School			1,184 63
Debentures and Coupons Due and Unpaid—			
Gemmell Debenture, By-law No. 634		$800 00	
Gemmell Coupons, By-law No. 634	$112 50		
Sewerage Coupons, By-law No. 1,085	46 30		
Granolithic Coupons, By-law no. 1,086	76 92	235 72	
		$1,035 72	

Floating—			
Collegiate Institute Taxes, 1909	$2,088 51		
Public School Taxes, 1909	3,057 48		
R. C. School Taxes, 1909	115 42		
		5,261 41	
Outstanding Orders		396 15	
			6,693 28
Balance Due on Contract, Town Hall, McAndrew Bros.			615 00
			$208 861 73
Surplus of Assets and Liabilities			72,845 35
			$281,707 08

Summary of Receipts and Disbursements for Year 1904.

Receipts.

Cash on hand, January 1, 1904	$4,981 31
Taxes of 1904	24,678 10
Arrears of Taxes, 1903	978 19
Rents, Town Hall	503 00
Licenses, amount received for Liquor Licenses	1,484 45
Electric Light, received from Stores and Water Power	413 84
Fines, Police Court	95 75
Dog Taxes	161 00
Billiard Licenses	20 00
Auctioneers' Licenses	20 00
Local Improvement Fund	395 08
Interest on General Account	18 43
	$33,749 15

Disbursements.

Salaries	$1,743 33
Insurance	120 07
Debentures, Coupons	5,507 55
County Rates	3,285 01
Board of Health	227 15
Charity	174 62
Printing and Stationery	375 31
Public School	4,405 24
Collegiate Institute	4,385 54
R. C. Separate Schools	1,060 80
Market	447 77
Fire, Water and Light	2,301 48
Electric Light	1,356 17
Streets, Labour and Supplies	1,127 20
Miscellaneous	1,043 22
Cash on hand, carried forward	6,188 69
	$33,749 15

Summary of Receipts and Disbursements for Year 1905.

Receipts.

Cash on hand, January 1, 1905	$6,188 69
Taxes of 1905	28,361 86
Taxes of 1904	963 79
Rents, Town Hall	571 00
Rents, Room, Dominion Election	12 00
Licenses, from Liquor Licenses	1,424 45
Electric Light	600 50
Water Power, rent	168 00
Licenses, Billiard Rooms, etc.	60 00

Police Court Fines	154 25
Dog Taxes	149 00
Statute Labour	33 00
Interest on Deposit in Bank	23 92
	$38,710 46

Disbursements.

Salaries	$1,849 84
Insurance	162 07
Law costs	185 00
Debentures and Coupons	7,884 45
County Rate	3,283 05
Board of Health	225 80
Charity	49 35
Printing and Stationery	907 24
Public School	4,142 49
Collegiate Institute	8,694 41
R. C. Separate School	1,597 74
Market	695 88
Fire and Water	887 45
Electric Light	2,898 62
Street Labour and Supplies	2,641 22
Miscellaneous	1,219 59
December 31st, Cash on hand, carried forward	6,386 26
	$38,710 46

SUMMARY OF RECEIPTS AND DISBURSEMENTS FOR YEAR 1906.

Receipts.

Cash on hand, January 1st, 1906	$6,386 26
Taxes of 1906	29,630 30
" " 1905	1,037 71
Rents from Town Hall	736 25
Licenses, Liquor Licenses	1,452 69
Electric Light, Store Lights	667 22
Rent, Power Saw mill	168 00
H. K. Wampole Co., amount received from them	1,000 00
Dog Taxes	151 00
Licenses, Circus and Billiard License	120 00
Taxes on pt. of Lot 2, North Craig St. (1904)	11 50
Fines, Police Court	147 00
Public Library, Debenture account	30 00
Interest account on Bank Balance	34 90
	$41,572 83

Disbursements.

Salaries	$1,939 84
Insurance	144 82
Debentures and Coupons	11,112 58
County Rates	2,836 40
Board of Health	110 68
Charity	75 34
Printing and Stationery	458 79
Law costs	308 38
Public School	3,907 43
Collegiate Institute	3,140 16
R. C. Separate School	687 32
Market	3,322 60
Fire and Water and Light	901 45
Electric Light	2,321 51
Street Supplies	224 63
Street Labour	1,612 92
Miscellaneous	851 01
Cash Balance, Dec. 31, 1906	7,616 97
	$41,572 83

Summary of Receipts and Disbursements for Year 1907.

Receipts.

Cash on hand, January 1, 1907	$7,616 97
Taxes of 1907	31,441 24
Taxes of 1906	1,029 39
Licenses—Liquor Licenses	1,390 57
Electric Light—Rents and Lights	718 45
Rents—Post Office and Town Hall	635 00
Proceeds Sale of Debentures, Wampole and School	26,645 33
Transfer from Sewerage Account	1,710 02
W. H. Wampole in lieu of Taxes	1,000 00
Transfer from Granolithic Account	352 74
Lanark Co., Stone for Gaol	36 00
Licenses—J. A. Kerr	125 00
Fines—Account of Fines	105 00
Railway Taxation, Provincial	141 04
Statute Labour and B. Tax	75 00
M. D. White—Return car fees	59 75
Dog Tax	153 00
Bank Interest	31 56
	$73,266 06

Disbursements.

Salaries	2,123 84
Insurance	62 57
Board of Health	112 00
Charity	57 62
Printing and Stationery	487 67
Public School Grant	185 00
Public School Taxes	5,447 34
Separate School Taxes	1,694 70
Collegiate Institute	3,500 00
County Rate	3,224 21
Bills Payable, Wampole Note	26,706 68
Debentures	7,133 36
Interest Account—Interest on above	6,995 36
Granolithic—Clement, L.	161 70
Sewerage Account	1,660 27
Fire and Water	484 72
Electric Light	1,984 06
Market	699 49
Street Labour and Supplies	4,425 15
Miscellaneous	1,348 02
Cash on hand, Dec. 31, 1907	4 772 30
	$73,266 06

Summary of Receipts and Disbursements for Year 1908.

Receipts.

Cash on hand, January 1, 1908	$4,772 30
Taxes of 1908 and arrears of 1907	34,886 90
Licenses received from S. M. Barnes	1,388 63
Electric Light—From Lights and Rent	707 93
Rents from Post Office, Town Hall and Fire Hall	640 20
Wampole Co.—Taxes	1,000 00
Interest on Debentures	587 16
Railway Tax	116 94
Transfer from Sewerage Account	8 25
Fines	73 50
Refund of Registration	5 00

Refund of Taxes	9 81
Constable Frees, White and Steele	30 75
Dog Tax	188 00
Licenses—Billiard and Theatre and Peddlers'	118 00
Interest on Bank Balance	20 52
	$44,553.89

Disbursements.

Salaries	2,027 50
Insurance	118 56
Board of Health	113 33
Charity	76 95
Printing and Stationery	503 65
Collegiate Institute	3,641 69
Public School	5,500 00
Separate School	1,306 57
Streets and Supplies	1,635 88
Debentures and Coupons	14,888 53
County Rates	3,381 99
Sewerage	8 25
Fire, Water and Light	951 37
Electric Light	2,089 61
Market	1,621 11
Sundries	1,466 01
Interest on Overdraft	269 99
Cash Balance, December, 1908	4,952 90
	$44,553 89

SUMMARY OF RECEIPTS AND DISBURSEMENTS FOR YEAR 1909.

Receipts.

Cash on hand, January 1, 1909	$4,952 90
Taxes of 1908	1,322 56
Taxes of 1909	34,137 91
Licenses—Amount received from S. M. Barnes	1,147 75
Electric Light—Amount received from Stoves	440 15
J. Ritchie—Water Power Rent	168 00
Rents—Post Office	210 00
Rents—Town Hall and Fire Hall Rents	409 80
July 31.	
Loan Transfer from Sewerage Account	8,000 00
H. K. Wampole—Taxes	1,000 00
Sewerage Account—Accrued Interest	1,828 80
Granolithic Account—Accrued Interest	210 52
Dog Tax	155 00
Railway Tax	139 94
Peddlers' Licenses	85 00
Miscellaneous	282 68
	$54,491 01

Disbursements.

Salaries		$2,031 42
Insurance		210 65
Board of Health		111 60
Charity		96 12
Printing, Advertising and Stationery		363 26
Collegiate—		
Balance Taxes, 1908	$2,450 50	
Schools, Account Taxes, 1909	1,500 00	
		3,950 50
Public School—		
Balance Taxes, 1908	$3,302 96	
Schools, etc., Taxes, 1909	2,447 04	
		5,750 00
County Rates		3,443 82
Interest Account—Interest on Overdraft, Merchants Bank		81 31

Debentures and Coupons	16,493 44
Fire and Water	709 41
Electric Light, Sundry Repairs and Expenses	2,897 76
Market	1,063 48
Streets	2,359 45
Supplies	642 42
Miscellaneous	1,825 05
Dec. 22.	
Loan—Refund of Loan	8,000 00
Schools, Separate Account, 1909, Taxes Balance	3,461 32
	$54,491 01

ELECTRIC LIGHT PLANT.—COST OF PURCHASE BY TOWN.

Receipts.

1904.		
Oct. 24.	To Cash Proceeds of Debentures	$11,855 20
Dec. 21.	" Overpaid contra	225 19
1905.		
Jan. 10.	" Cheque from Town to Balance	226 49
		$12,306 88

Disbursements.

1904.				
March	29.	By Cash, J. A. Allen, Legal Expenses	$200 00	
April	11.	" James Armour	2 00	
"	"	" J. A. Stewart, Expenses, Toronto—two trips	42 00	
"	"	" C.P.R. Telegraph Co., Message	3 54	
"	"	" B. Walker, Printing	55 20	
"	28.	" Interest on Loan	1 00	
May	4.	" J. A. Allen, Legal Expenses	192 28	
"	"	" C. F. Stone	93 55	
"	"	" Ball Electric Co., Lamps	105 00	
"	"	" C.P.R., Freight on Lamps	2 91	
"	"	" Duty on Lamps	31 50	
"	13.	" Amount of Purchase	10,000 00	
"	31.	" Jno. DeWitt, 1 acre	100 00	
"	"	" John Ritchie, Repairs D.	35 53	
"	"	" Walker Bros., Printing	58 20	
"	"	" Interest on Loan	26 85	
June	30.	" Interest on Loan	44 10	
July	1.	" J. A. Allen, Legal Expenses	105 34	
"	30.	" Interest on Loan	47 15	
Aug.	30.	" James & Reid, Supplies, Lamps for S.	60 68	
"	31.	" Interest for August	47 30	
Sept.	30.	" Interest for September	46 25	
Oct.	1.	" John Ritchie, Repairs	400 00	
"	31.	" Interest, October	37 15	
Dec.		" John Ritchie, Repairs	342 86	
1905.				
Jan.	1.	" Amount overdrawn, Bank	225 19	
"	"	" Interest to date	1 30	
				$12,306 88

1910.

Expenditures.

General Municipal Debenture:		
Sewerage Debenture	$5,697 22	
Granolithic Debenture	3,021 18	
Gemmell Bonus Debenture	876 50	
Wampole Debenture	2,120 00	
Electric Light Debenture	728 00	
Library Debenture	115 31	
		$12,558 21

Education.

Public School, including Debenture of $336.40	$5,794 75	
Collegiate Institute, including Debenture of $300.26	4,907 62	
R.C. S.S.	1,122 66	
		11,825 03
County Requisition		3,430 20
Overdraft in Bank, Aug. 24, 1910		12,516 07
Municipal Salaries	1,333 30	
Fire Brigade Officers	121 25	
" " Yearly Pay of men	350 00	
		1,834 55
Estimate for Relief Purposes, say	934 67	
		$43,098 73

Debentures, principal and interest, payable 1910, as shown by Debenture register, is $16,685.26, whereas estimate shows $12,558.21; this is explained by deducting owners' share. Local Improvements, $3,490.39, as also Public School, Collegiate Institute Debentures, $636.66, or a total of $4,127.05; on the other hand the same amount is deducted from receipts of levies to meet maturing debentures and interest. By such procedure I do not see what is to be gained, as it does not show the estimates in their true light.

1910.

Estimated Revenue and Expenditure.

Total Revised Assessment for Collegiate Institute Purposes	$1,314,890 00
" " " " Public School Purposes	1,127,780 00
" " " " R.C. Separate School Purposes	187,110 00
" " " " Town Purposes	1,309,890 00
" Exemptions from all but school purposes rates	5,000 00

Receipts.

Debentures:		
Sewers Debentures on $1,309,890 Assessment	$5,763 51	
Granolithic " " "	3,012 74	
Gemmell Bros., and Wampole Debentures on $1,309,890 Asst..	3,012 74	
Electric Light and Library " " " ..	785 93	
		$12,574 92

Education

Collegiate Institute, including Debentures on $1,314,890.00	$4,996 58	
Public School, including Debentures on $1,127,780.00	5,638 90	
R.C. Separate School, including Debentures on $187,110 00	1,122 66	
		11,758 14
County Rates requisitioned, $1,309,890.00		3,405 71

Sundry Sources.

Liquor Licenses say:	$700 00	
Town Hall	250 00	
Statute Labour	35 00	
Police Court	75 00	
Balance of 1909 Taxes	1,200 00	
Due from Sewer Account	926 67	
Post Office Rent	105 00	
Electric Light System	100 00	
Wampole Co.	1,000 00	
Sundry Sources	100 00	
Advanced to Collegiate Institute, a/c 1910 Taxes	911 49	
" Public School "	942 52	
" R.C. Separate School "	500 00	
		$6,845 68
Town Rate on $1,309,890		8,514 28
		$43,098 73

Estimates.

I attach to this report schedule of estimates for current purposes, which will serve to show the Council what they have to deal with in the matter of finance.

As the deficit from 1909 of $2,041.63 was one of the reasons given for the further increase of rates, I trust that the coming year will not be so burdened.

Annual Amount Granted County of Lanark.

1904-1910.

Grant, 1904	$3,285 01
" 1905	3,283 05
" 1906	2,836 40
" 1907	3,224 21
" 1908	3,381 99
" 1909	3,443 82
	$19,454 48
Average for six years	3,242 00

PUBLIC SCHOOLS.

1904.

Estimate		$4,653 68
Balance forward		62 67
Receipts.		
Town of Perth	$4,405 24	
Government Grant	459 00	
Special School, Bathurst	31 00	
" " Drummond	12 71	
Fees	63 25	
		4,971 20
		$5,033 87
Expenditure.		
Salaries, Teachers, etc.	$4,151 00	
Fuel	552 69	
Repairs	81 95	
Printing and Stationery	34 90	
Insurance	44 07	
Sundries	105 20	
		$4,969 81
Balance on hand		64 06
		$5,033 87

1905.

Balance on hand		$64 06
Receipts.		
Town of Perth, $3,711.87	$4,142 49	
County Grant	300 00	
Government Grant	449 00	
Fees	49 00	
Special tax, Drummond	13 12	
		$4,953 61
		$5,017 67

Expenditure.

Salaries	$4,168 00	
Printing and Stationery	54 47	
Fuel	467 08	
Maps	95 00	
Sundries	115 29	
		$4,899 84
Balance on hand		117 83
		$5,017 67

1906.

Balance on hand	$117 83

Receipts.

Town of Perth, $4,982	$3,907 43	
County Grant	150 00	
Government Grant	417 00	
Fees	44 85	
Special tax, Drummond	10 35	
" " Bathurst	12 00	
		$4,541 63
		$4,659 46
Overdraft		1,165 63
		$5,825 09

Expenditure.

Salaries	$4,291 22	
Building	900 00	
Fuel	447 53	
Printing and Stationery	73 92	
Maps	16 80	
Sundries	95 62	
		$5,825 09

1907.

Receipts.

Town of Perth, $5,470.84	$5,632 34
Town Advance p. By-law Imp.	1,675 00
Government Grant	413 00
County Grant	150 00
Fees	25 30
Special tax, Bathurst	19 67
" " Drummond	28 56
	$7,943 87

Expenditure.

Overdraft, 31st December, 1906		$1,165 63
Salaries	$5,089 46	
Fuel	574 90	
Building	197 78	
Printing	50 42	
Insurance	112 95	
Repairs	22 83	
Sundries	233 09	
		$6,281 43
		$7,447 06
Balance on hand		496 81
		$7,943 87

1908.

Receipts.

Balance on hand		$496 81
Town of Perth, $5,864.50	$5,500 00	
Government Grant	402 25	
Fees	35 50	
Special tax, Bathurst	21 45	
" " Drummond	12 60	
		$5,971 80
		$6,468 61

Expenditure.

Salaries	$5,317 50	
Fuel	470 48	
Repairs	225 76	
Printing	37 90	
Building	179 00	
Sundries	232 72	
		$6,463 36
Balance on hand		5 25
		$6,468 61

1909.

Balance on hand	$5 25

Receipts.

Town of Perth, $5,471	$5,750 00	
Provincial Treasurer	396 25	
Fees	38 34	
Drummond (special tax)	26 52	
Bathurst " "	24 00	
C. I. Smith (Fence)	6 00	
		$6,241 11
		$6,246 36

Expenditure.

Salaries	$5,249 73	
Special Government Grant (Teachers)	176 25	
Fuel	451 46	
Repairs	73 08	
Printing and Stationery	28 70	
Sundries	164 44	
		$6,143 66
Balance on hand		102 70
		$6,246 36

COLLEGIATE INSTITUTE.

1904.

Estimate p. Minute Book, Town's proportion	$4,142 71
Balance in Bank	228 65

Receipts.

Town of Perth	$4,385 54	
Fees	167 50	
Treasurer of Ontario, Grant	924 51	
County Grant	1,297 06	
Insurance refund	27 50	
F. L. Michell, fees	60 00	
		$6,862 11
		$7,090.76

Expenditure.

Salaries	$5,265 50	
Fuel	409 38	
Repairs	64 32	
Examination	172 55	
Printing and Stationery	55 05	
Maps, etc.	238 76	
Insurance	40 00	
Sundries	94 04	
		$6,339 60
Balance in Treasurer's hands		751 16
		$7,090 76

1905.

Balance in Bank	$751 16

Receipts.

Town of Perth, Est., $4,191.05	$3,694 41	
Non-resident Fees	303 50	
Government Grant	952 75	
County Grant	1,480 38	
F. L. Michell	57 00	
		$6,448 04
		$7,239 20

Expenditure.

Salaries	$5,241 00	
Fuel	366 45	
Printing and Stationery	154 67	
Chemicals	50 35	
Repairs	3 95	
Examinations	171 55	
Sundries	137 18	
		$6,125 15
Balance in Treasurer's hands		1,114 05
		$7,239 20

1906.

Balance forward	$1,114 05

Receipts.

Town of Perth, $3,013.21	$3,140 16	
Special School Debenture, account Merchants Bank	700 00	
Government Grant	961 56	
County Grant	1,609 20	
County Pupils	290 00	
Non-resident Pupils	54 00	
Michell, F. L., fees	43 00	
		$6,797 92
		$7,911 97

Expenditure.

Salaries	$5,244 03	
Fuel	371 73	
Repairs	78 64	
Printing and Stationery	60 57	
Equipment, Maps, etc.	650 00	
Examinations	165 40	
Building	350 00	
Gran. walks	129 56	
Insurance	8 65	
Sundries	84 48	
		$7,143 06
Balance in Treasurer's hands		768 91
		$7,911 97

1907.

Receipts.

Balance forward			$768 91
Town of Perth, Est., $2,988.28	$4,000 00	$3,500 00	
Government Grant	1,056 65		
County Pupils	317 50		
Non-resident Pupils	53 00		
F. L. Michell, Fees	54 00		
Ontario Grant, Agricultural School	1,000 00		
Mathieson, A. I. (Donation)	100 00		
County Grant	1,744 55		
			$8,325 70
			$9,094 61

Expenditure.

Salaries	$6,310 75	
Repairs	180 43	
Fuel	372 59	
Printing and Stationery	66 98	
Maps, etc.	79 30	
Examinations	182 45	
Agricultural Class	178 79	
Building	30 33	
Insurance	40 00	
Sundries	204 48	
		$7,646 10
Balance in Treasurer's hands		1,448 51
		$9,094 61

1908.

Receipts.

Balance forward		$1,448 51
Town of Perth, $3,803.92	$3,641 69	
Government Grant	1,148 98	
" " for Military Institute	50 00	
County Grant	1,921 83	
Grant, Agricultural Class (Gov.)	1,200 00	
Pupils' fees	310 50	
Non-resident fees	21 00	
Fees per F. L. Michell	66 00	
		$8,360 00
		$9,808 51

Expenditure.

Salaries	$7,428 08	
Fuel	425 03	
Printing	98 74	
Building	161 26	
Agricultural classes	267 05	
Examinations	192 20	
Repairs	43 14	
Sundries	203 94	
		$8,819 44
Balance in Treasurer's hands		989 07
		$9,808 51

1909.

Receipts.

Balance forward		$989 07
Town of Perth, $3,361 42	$3,950 50	
County Grant, main account	2,014 77	
" " Statutory Grant, Agricultural classes	500 00	
Government Grant	1,219 00	
" Agricultural Classes	1,200 00	
County Pupils	280 50	
Michell, F. I., fees	71 00	
Government Grant, Military Instruction	50 00	
Non-resident fees	10 00	
		$9,295 27
		$10,284 84

Expenditure.

Salaries	$7,552 50	
Fuel	353 97	
Repairs	294 56	
Agricultural Classes	52 85	
Examinations	190 99	
Printing and stationery	67 73	
Maps, etc.	65 00	
Insurance	37 50	
Sundries	116 12	
		$8,731 22
Balance in Treasurer's hands		1,553 62
		$10,284 84

ANNUAL AMOUNT GRANTED SEPARATE SCHOOLS.

1904	$1,060 80
1905	1,597 74
1906	687 32
1907	1,694 70
1908	1,306 57
1909	1,000 00
	$7,347 13

GRANOLITHIC ACCOUNT.

1904.

1904.			
January	1.	By Balance due Sovereign Bank	$9,269 17

Disbursements.

		By January 1st, to 30th June, and Interest	$1,043 54	
		" July 1st, to 31st August, Interest	150 85	
September	30.	" Interest on Loan	43 00	
October	31.	" Disbursements and Interest to date	56 44	
November	30.	" Interest to date	43 40	
				$1,337 23
Due Sovereign Bank				$10,606 40

1905.

1905.				
January	1.	By Balance due Sovereign Bank		$10,606 40
"	31.	" Disbursements and Interest to date	$548 27	
February	28.	" Interest to date	42 80	
March	23.	" "	32 25	
				$623 32
				$11,229 72

March	21.	To proceeds, Debenture By-law 946	$3,297 58	
		Accrued Interest	31 57	
				$3,329 15
		Proceeds, Debenture By-law 947	$7,593 46	
		Accrued Interest	72 66	
				7,666 12
		Proceeds, debenture 949	$623 25	
		Accrued Interest	6 15	
				629 40
May	11.	Accrued Interest on Debentures		12 17
				$11,636 84
		Balance due Sovereign Bank brought down		11,229 72
		Balance at credit in Sovereign Bank		$407 12

1906.

1906.				
January	1.	To Balance in Sovereign Bank		$407 12
"	8.	" Interest on Deposit	$9 37	
June	14.	" Clement & Seal	200 00	
"	14.	" "	1,000 00	
				$1,209 37
				$1,616 49

Disbursements.

April.	By Cash, G. F. Kerr		$2 50	
	" Sewage account		217 28	
	" L. Moore		3 00	
				$222 78
	" Mortimer Publishing		$9 00	
	J. A. Allan, Legal		18 50	
				27 50
July.	Disbursements for month		$2,320 03	
Aug.	"		6,579 59	
Sept.	"		3,294 98	
Oct.	"		1,628 89	
Nov.	"		1,024 41	
Dec.	"		1,051 97	
				$15,899 87
				$16,150 15
	Balance at credit brought down			1,616 49
	Balance due Sovereign Bank			$14,533 66

1907.

1907.			
January 1.	Balance due Sovereign Bank		$14,533 66

Disbursements for month and Interest.

January	$168 61
February	57 28
March	2,197 43
April	73 22
May	342 38
June	88 94
July	88 95

August		89 40	
September		86 98	
October		41 92	
November, Telegram	$0 51		
Merchants Bank	1,014 44		
		1,014 95	
Merchants Bank		1,014 44	
			$5,314 00
			$19,847 66
October 24. To proceeds of Debentures, By-law 1021		$18,833 22	
" Cash from Merchants Bank		1,014 44	
			$19,847 66

Account closed and transferred to Merchants Bank.

1908.

1908.

Disbursements for month of:—

July, By	$111 59	
August, "	9 55	
September, "	3,725 63	
October, "	1 00	
November, " and Interest	4,525 91	
December, " Interest overdraft	34 44	
		$8,408 12
July 15. To H. A. Pruner, on contract	$1,000 00	1,000 00
Balance due Merchants Bank		$7,408 12

1909.

1909.			
January 1. By Balance due Merchants Bank			$7,408 12
January, Disbursements for month, C. T. Stine		$4 66	
February, " Interest		70 20	
March, " "		94 29	
(April) June, " C. T. Stine		13 70	
(May) July, " Interest		59 18	
(June) Sept., " Printing		25 00	
(July) Oct. " "		15 00	
August		.....	
September		.....	
October		.....	
November		709 00	
December, Transfer, accrued Interest to General account		210 52	
H. A. Pruner, of balance returned on contract		282 77	
			$782 41
			$8,190 53
June 1. To Geo. Mathall, frontage tax		$7 56	
July " Proceeds, Debentures		8,129 67	
Aug. 30. " Interest, Merchants Bank		1 35	
Nov. 30. " " " "		3 45	
Dec. 28. " Sewerage account, share of	Deb.	48 50	
January 1/10. Interest on deposit		40	
			$8,190 93
Balance brought down			8,190 53
Balance in Bank at credit, 40c.			$0 40

PUBLIC LIBRARY.

Summary of Receipts and Disbursements, for Year Ending 31st December, 1909.

Receipts.

Cash on hand, January 1st, 1909	$175 19
Legislature Grant	159 51
Town Grant	950 00

Donation received from Horticultural Society	15 00
" " " Woman's Institute	13 00
Subscriptions	76 79
Union Depot	72 10
Sale of Papers	1 82
	$1,463 41

Disbursements.

January 1.		
Salary, Librarian	$239 24	
" Caretaker	108 29	
William Briggs, for books, etc.	238 70	
Miss Nicholl, books	54 52	
" papers	20 22	
International Text Book Co	40 00	
C. F. Stone, printing	25 50	
Walker Bros.	1 50	
Insurance *re* Foy & Whately	33 50	
A. McArthur, for coal	85 82	
Henry Taylor, for coal	86 28	
Canadian Electric and W. P. Co.	149 45	
John Hart, sundries	6 14	
D. Kippen, P. O. rent	2 00	
W. H. Hicks, sundries	2 75	
P. Hope, sundries	1 77	
Miss L. Nicoll	1 00	
W. A. McLenagher, sundries	4 75	
Geo. W. Thompson, "	130 57	
H. M. Shaw, "	8 62	
F. A. Wright, "	15	
Rudd & Neilson, "	1 90	
Carl Goldback, stove	20 00	
Arthur Charlton	2 00	
W. Wilson, sodding	23 00	
Outstanding cheques on 31st December, 1909	9 18	
Excess of Receipts over Disbursements	$166 56	$1,463 41
Cash in Treasurer's hands on 31st December, 1909		$166 56

PUBLIC LIBRARY.

CORRECT STATEMENT OF CASH IN TREASURER'S HANDS AS ON THE 31ST OCTOBER, 1910.

January 2.	To cash in Bank	$166 56	
	" " received to 31st October, 1910	844 69	
			$1,011 25
August 16.	Less amount charged bank twice as Deposit		8 63
			$1,002 62
	By amount disbursed to 31st October, 1910	$562 09	
	" cheques not posted	127 36	
	" cheque No. 66 entered as $2 25		
	" should be 2 28		
		03	
			$689 48
			$313 14

Cash in Bank of Ottawa on 31st October, 1910, as shown by Pass Book on that date.

1904.

SEWERAGE ACCOUNT.

January 1. By balance due Sovereign Bank $6,757 28

Disbursements, with Interest.

January	$694 49
February	1,066 07
March	130 80

April	135 85	
May	392 98	
June	1,378 94	
July	2,304 40	
August	5,157 15	
September	6,944 43	
October	4,412 24	
November	2,752 92	
December	3,138 67	
		$28,508 94
		$35,266.22
October 25. To Proceeds, Debentures sold		29,794 65
December 31. By balance carried forward		$5,471 57

1905.

January. By Balance forward from 1904 ..... $5,471 57

Disbursements for month and Interest.

January	$168 33	
February	159 76	
March	149 95	
April	758 04	
May	3,474 61	
June	4,564 38	
July	2,341 90	
August	5,498 30	
September	3,774 77	
October	2,801 24	
November	2,850 25	
December	2,571 10	
		$29,112 63
		$34,584 20
Deduct Receipts		457 08
Balance due Bank		$34,127 12

1905.

To Cash, Sewerage Connection.

April 29.	Moore, W. A.	$2 62	
	Blain, I. W.	19 26	
	Merchants Bank	42 19	
	Hogan, P. I.	3 82	
	McEwan, W. P.	3 87	
	Spence, P.	7 48	
	Foy, C. I.	4 99	
	Meighan, C.	4 30	
			$88 53
July 11.	Senkler, W. S.	$43 64	
	McCallum, U.	15 62	
	Wilson, G.	12 94	
	McPhail, D.	24 37	
	Armour, I.	53 87	
	Williamson, E. T.	11 42	
	Campbell, J. G.	6 94	
	Pink, W. I.	9 98	
	Shillington, Mrs.	19 82	
	Lapoint, M.	12 21	
	Hogan, I.	3 74	
	Devlin, Mrs. I.	24 13	
	Armour, R.	42 39	
	Bo, Mrs.	16 46	

July 11.	Kellock, I. F.	11 82	
	Walker, W. T.	6 67	
	Michell, F. L.	13 95	
	Code, John	19 23	
	Waddell, Miss E.	5 48	
			$354 69
Aug. 1.	James, Approach		1 82
Dec. 27.	W. A. Moore, coal		12 04
			$457 08

1906.

January 1.	To cash, W. A. Moore, coal		$6 19
April 1.	Transfer from Town account		428 61
	" " Granolithic account		217 28
	To Approaches, G. A. Cousett		4 76
June 29.	" Meighen Dwelling		73 08
	Proceeds of Debenture principal, premium and accrued interest	$20,741 09	
	Less Debenture sold	327 83	
			20,413 26
July 10.	Town work, street department		41 64
August 9.	W. G. Pink, sewerage construction		12 39
	J. Armour		1 28
	2 cords stone, Mrs. Sutherland		5 00
	Granolithic account, stone		600 00
	Town Debenture By-law 974, sewerage, 1905	$491 09	
	974, " 1906	491 09	
			982 18
	Stone for streets		250 00
	Town Debenture, 960, 1905		627 83
			$23,663 50

1906.

January 1.	By Balance forward 1905	$34,127 12

Disbursements for month and interest.

January	$152 08	
February	404 24	
March	225 20	
April	143 45	
May	2,466 44	
June	3,344 69	
July	3,809 85	
August	3,165 44	
September	2,305 16	
October	1,783 75	
November	2,082 06	
December	1,902 30	
		$21,784 66
		$55,911 78
Deduct—		
Receipts		23,663 50
Balance due Bank		$32,248 28

1907.

March 1.	To Cash, Sewerage Approaches:		
	" Marks, R. W.	$42 39	
	" Stewart, R.	6 86	
	" Spaulding, Jas.	7 76	
			$57 01
April 1.	" Oliver, R.		8 08
Sept. 1.	" S. T. Carnegie, Public Library	$100 00	
	" Proceeds, Debentures	29,585 85	
			29,685 85

Oct. 18.	To Sewerage Approaches:			
	" Church Wardens, St. James Church		$45 00	
	" Marnon, Mrs. May		5 56	
	" McGuggan, Mrs. J.		3 90	
	" Wilson, G.		7 30	
	" McArthur, A. T.		2 55	
	" Bryson, Miss		9 34	
	" Hartney, B.		78	
	" Hughes, Mrs. M.		3 28	
	" Kippon, D.		9 37	
28.	" Bank of Montreal		21 36	
				$108 44
Nov. 27.	" Cash from Merchants Bank to close out account with Sovereign Bank			5,641 90
				$35,501 28

1907.

January 1.	By overdraft, Sovereign Bank		$32,248 28

Disbursements for month and interest.

January		$384 56	
February		126 35	
March		155 08	
April		500 25	
May		732 58	
June		776 85	
July	Interest	177 61	
August	"	178 55	
September	"	164 38	
October	"	28 75	
November		28 04	
			$3,253 00
			$35,501 28
Deduct—			
Receipts			35,501 28

Account transferred to Merchants Bank.

Nov. 27.	Due Merchants Bank transfer to Sovereign Bank to close account		$5,641 90
Dec. 27.	Transfer from Sewerage Account to General Account	$1,710 02	
	H. Keays	10 00	
			1,720 02
			$7,361 92
Dec. 30.	To C. P. R. Sewerage	$406 50	
	" Sewerage Debenture and interest	491 04	
			$897 54
" 31.	Balance due Merchants Bank		6,464 38
			$7,361 92

1908.

1908.			
April 24.	To proceeds sale debenture	$7,991 57	$7,991 57
	" James B. approaches		17 21
May 31.	" Interest		2 67
June 9.	" Martin & Rabb, Deposit		1,000 00
Sept. 30.	" Proceeds sale debentures		5,759 46
	" Principal premium and accrued interest	$1,699 22	
Oct. 1.	" Less commission	45	
			1,698 77
	" Proceeds debentures		
	" Principal premium and accrued interest	$6,654 47	
	" Less commission	1 75	
			6,652 72
			$23,122 40

1908.

1908.

January 1. Balance forward due Merchants Bank $6,464 38

Disbursements for month and interest.

January	$82 95	
February	306 11	
March	171 30	
April	78 42	
May	145 23	
June	250 98	
July	3,500 25	
August	2,234 42	
September	4,996 81	
October	5,817 48	
November	1,177 26	
December	2,620 58	
		$21,381 49
		$27,845 87
Deduct—		
Receipts		$23,122 40
Balance due Merchants Bank		$4,723 47

1909.

1909.			
Feb. 1.	To	Pink, W. I., Connections	$27 08
"	"	James, E., Connections	16 00
July	"	Proceeds of debentures sold	27,356 03
Aug. 31.	"	Interest to date, credit balance	29 62
Nov. 30.	"		101 80
Dec. 22.	"	Refund of Loan from General Account	8,000 00
31.	"	Interest on credit balance	39 12
			$35,569 65

1909.

1909.

January 1. By Balance forward, 1908 ..... 4,723 47

Disbursements for month.

January	$3,619 09	
February	89 66	
March		
April	283 31	
May	155 62	
June	104 27	
July	93 36	
August	25 00	
September	35 58	
October	44 08	
November	29 42	
December	3,000 34	
July 31. Transfer to General Account	8,000 00	
		$15,479 73
		$20,203 20
Receipts brought down		35,569 65
Balance at Credit in Merchants Bank		$15,366 45

1910.

1910.			
January 1.	To balance in Merchants Bank		$15,366 45
Feby. 28.	" Interest on Deposit		99 07
May 31.	" "		155 29
June 29.	" Crosly, W., Connections		3 00
Aug. 31.	" Interest Merchants Bank		154 09
			$15,777 90
	" Disbursements		686 68
	" Balance at Credit in Merchants Bank		$15,091 22

1910.

1910.				
Feby.	By T. Robertson, Auditor	$15 00		
	" D. G. McMartin, "	15 00		
				$30 00
April.	" Rogers & Nichol	$8 20		
	" N. Jaques	3 60		
	" A. McGlade	4 80		
	" A. H. Keays	1 00		
	" J. Armstrong	4 80		
	" J. McGowan	50		
				22 90
May	" Rogers & Nichol	$9 04		
	" Butlers, W. G.	3 50		
	" White, I.	6 40		
	" Moore, Jas.	7 05		
	" Keays, A. H., assistant engineer	2 00		
	" Bates, G. W.	25		
	" Collins, S.	50		
	" Keays, A. H., assistant engineer	2 00		
	" White, I., labour	6 53		
	" Keays, A. H.	1 50		
	" Butler, W. G.	7 79		
				46 06
June.	" Moore, I. H.	40 71		
	" Gallipaun, G.	50		
	" Rogers & Nichol (paper)	5 46		
	" Moore, Jas., labour	3 98		
	" Haw, W.	1 50		
	" Moore, I., labour	2 05		
	" White, I.	9 00		
	" James Reid, supplies	21 80		
	" Moore, James, labour	10 50		
	" Bates, G. W.	50		
	" Rogers, W.	1 75		
	" Keays, A. H.	3 00		
	" James Reid, supplies	16 74		
	" White, I., labour	19 50		
	" Moore, I., labour	19 50		
	" Keays, A. H., service	1 00		
	" Cameron, A. U., service	6 60		
				164 09
July 1.	By Cash, Rogers, W., connections	$5 25		
	" Rogers & Nicholl	11 49		
	" Butler, W. G.	3 50		
	" Mitchell, I. G.	25		
	" Bates, G. W.	2 00		
	" White, I.	22 65		
	" Moore, Jas.	24 45		
	" Beattie, W.	8 10		
	" Keays, A. H.	4 75		
	" James Reid	22 68		
				105 12

Aug. 1.	By Cash, Jamieson, R.		$0 30	
	" White, I., work		12 00	
	" Keays, A. H.		2 00	
	" Moore, Jas.		12 75	
	" Bates, W. G.		25	
				27 30
Sept.	" James Reid, pipe, sewer connection		$6 86	
	" Butler, W. G., sewer connection		6 95	
	" Cooper, A., carting		25	
	" White, I., work		1 20	
	" Beattie, Wm., work		6 75	
	" Free, Wm., work		6 75	
				28 76
Oct.	" White, I., labour		$19 00	
	" Morrison, I.		5 37	
	" Graham, Geo.		11 56	
	" Moore, I.		17 50	
	" White, I.		13 50	
	" Carpenter, I.		12 00	
	" Kerkham, T.		6 31	
	" Perry, W.		8 70	
	" James Reid, supplies		34 06	
	" Butler, W. G.		3 50	
	" McCallaugh, G.		1 50	
	" Bennett, G.		7 50	
	" Martin, L.		7 50	
	" Haddull, F.		2 25	
				150 25
	" McGlade, I.		$4 50	
	" Keays, A. H.		13 50	
	" Bates, W.G.		50	
	" Moore, I. H.		93 70	
				112 20
				$686 68

SUMMARY OF COLLECTORS' ROLLS, FOR THE YEARS 1904 TO 1909.

1904.

To Face of Roll	$25,639 40	
By Collected in 1904		$24,678 10
Uncollected		961 30
	$25,639 40	$25,639 40

1905.

To Face of Roll	$29,461 01	
By Collected in 1905		$28,361 86
Uncollected		1,099 15
	$29,461 01	$29,461 01

1906.

To Face of Roll	$30,873 58	
By Collected in 1906		$29,630 30
Uncollected		1,243 28
	$30,873 58	$30,873 58

1907.

To Face of Roll	$32,701 93	
By Collected in 1907		$31,441 24
Uncollected		1,260 69
	$32,701 93	$32,701 93

1908.

To Face of Roll	$35,119 69	
By Collected in 1908		$33,723 80
Uncollected		1,395 89
	$35,119 69	$35,119 69

1909.

To Face of Roll	$35,374 67	
By Uncollected in 1909		$34,137 91
Uncollected		1,236 76
	$35,374 67	$35,374 67

FINES COLLECTED BY MAGISTRATE TAYLOR, AND PAID TREASURER, 1904-1910.

1904.		
April	$15 00	
June	26 50	
October	40 00	
		$81 50
1905.		
January	$26 00	
March	30 00	
May	12 00	
July	41 25	
October	20 00	
December	25 00	
		154 25
1906.		
January	$9 25	
April	23 50	
July	28 50	
August	40 50	
November	20 25	
		122 00
1907.		
January	$25 00	
April	15 00	
June	20 00	
July	19 00	
October	26 00	
		105 00
1908.		
March	$25 00	
June	23 00	
October	25 50	
		73 50
1909.		
March	$16 00	
May	19 00	
November	17 00	
		52 00
1910.		
March	$30 00	
June	17 00	
August	5 00	
		52 00
1904.		
January 16.*		13 25
1906.		
December 12.*		25 00

*These items appear in Cash Book, but not in Statement furnished by Magistrate.

The following items appear in Cash Book which were not included in foregoing statement and received from various parties:

Sept. 21.	From Rogers, J. P.			1 00
1907.				
Oct. 3.	" White, M. D.			41 66
" 29.	" "			8 59
" 29.	" "			3 00
Nov. 11.	" Steele, Geo.			6 50
1908.				
Aug. 31.	" "			3 25
Nov. 20.	" White, M. D.			21 00
				$763 50

Dog Taxes.

1904.				
October,	P. I. A. Kerr		$100 00	
December	"		61 00	
				$161 00
1905.				
December,	P. M. D. White			149 00
1906.				
May & April	"		$103 00	
June	"		48 00	
				151 00
1907.				
April	"		$50 00	
June	"		53 00	
August	"		40 00	
December	"	Balance	10 00	
				153 00
1908.				
June	"		$51 00	
"	"		54 00	
July	"		51 00	
				156 00
1909.				
June	"		$55 00	
July	"		52 00	
September	"		48 00	
				155 00
				$925 00
1910.				
January,	P. Griffith		$2 00	
May	"		55 00	
"	"		57 00	
June	"		59 00	
September, 28	"		79 00	
			$252 00	

Average amount collected, 1904-1909	$154 50
Collected to 28th September, 1910	252 00

Recapitulation of Outstanding Debentures.

By-law			
634	Gemmell, R.		$1,700 00
897	Sewer Construction	$26,400 00	
960	"	18,206 54	
1020	"	28,294 39	
1046	"	7,718 63	
1060	"	5,200 12	
1061	"	1,573 12	
1062	"	6,160 62	
1083	"	4,985 36	
1084	"	1,760 18	
1085	"	18,308 04	
			$118,607 00

869	Granolithic walks		$8,100 00	
870	"		3,474 21	
946	"		2,757 89	
947	"		6,131 66	
1021	"		17,040 12	
1086	"		7,344 70	
				$44,848 58
921	Electric Light			10,700 00
984	Public Library Site			1,295 53
1026	Public School			1,184 63
1025	Collegiate Institute			817 71
957 and 1024	Wampole, H. K.			22,400 00
	Total Debenture Debt			$201,553 45

STATEMENT OF DEBENTURE DEBT, TOWN OF PERTH, AS AT 31ST DECEMBER, 1909, ALSO OUTSTANDING INTEREST TO DATE OF MATURITY.

By-law.	Original.	Outstanding.	Interest.	Rate.	Expires.
	$ c.	$ c.	$ c.		
634	11,000 00	1,700 00	117 00	4½	1911
869	12,155 00	8,100 00	2,088 00	4	1920
870	5,030 98	3,474 21	968 37	4	1921
897	30,000 00	26,400 00	15,104 00	4	1933
921	12,000 00	10,700 00	6,196 00	4	1933
946	3,371 07	2,757 89	962 86	4	1924
947	7,430 00	6,131 66	2,437 69	4½	1924
960	20,000 00	18,206 54	12,489 27	4½	1934
984	1,500 00	1,295 53	549 52	4½	1925
1020	29,703 87	28,294 39	23,876 90	5	1936
1021	18,835 92	17,040 12	8,654 53	5	1926
957 }	25,500 00	22,400 00	11,330 00	5	} 1925
1024 }			No. 1 and 2	4½	}
1025	1,300 00	817 71	83 07	5	1912
1026	1,700 00	1,184 63	150 97	5	1913
1046	8,019 34	7,718 63	5,972 12	5	1934
1060	5,543 82	5,200 12	2,807 18	5	1927
1061	1,623 21	1,573 12	1,383 40	5	1937
1062	6,356 76	6,160 62	5,427 94	5	1937
1083	5,075 86	4,985 36	3,527 30	4	1938
1084	1,815 07	1,760 18	1,007 17	5	1928
1085	18,587 82	18,308 04	16,757 89	5	1938
1086	7,573 76	7,344 70	4,202 55	5	1928
		$201,553 45	$126,093 73		

ELECTRIC LIGHT PLANT.

1904-1909.

1904, eight months.

	Receipts.		Expenditure.	Gain.	Loss.
Stores, etc.....	$468 76		$1,356 17		
Town lighting....	1,375 00	Pro. Deb. & Int....	500 00		
	$1,843 76		$1,856 17		$12 41

1905.

"	.... 783 50		$2,624 35		
"	.... 2,075 00		668 00		
	$2,858 50	Deb. & Int...	$3,292 35		433 85

		1906.		
Town lighting		" ...$2,321 51		
" 2,175 00		660 00		
	$3,010 22	$2,981 51	28 71	
		1907.		
" 705 04		" ...$1,984 06		
" 2,175 00		652 00		
	$2,880 04	$2,636 05	243 98	
		1908.		
" 696 61		" ...$2,081 11		
" 2,175 00		644 00		
	$2,871 61	$2,725 11	146 50	
		1909.		
" 583 20		$2,897 76		
" 2,175 00		636 00		-775 56
	$2,758 20	$3,533 76	$419 19	$1,221 82
			$802 63	
			$1,221 82	$1,221 82

Recommendations.

1. That the Treasurer be required to keep a Journal and Ledger.
2. That a Debenture and Coupon Cancellation file be kept.
3. That all by-laws be copied in a book to be kept for that purpose in consecutive numerical order with a proper index at the front.
4. That a license register be kept.
5. That a proper record of all arrears of taxes be kept.
6. That the Treasurer shall furnish the Council with a monthly statement of receipts and expenditures, cash in the bank, and also a memo of all outstanding cheques.
7. That an official form of receipt with stub properly numbered shall be adopted, and that all moneys received by the Treasurer from whatever source shall be acknowledged thereon.
8. That no cheque be issued except on the Town's official form, and that same be made payable to order, not bearer, and that where persons unable to write have occasion to endorse cheque "his 'X' mark" shall be witnessed by some person other than the Treasurer. Cheque to be properly signed by officials duly authorized, stub numbered with full particulars, date, etc.
9. That the Town's bankers be notified that all cheques issued are not to be payable unless properly signed and counter-signed by the authorized officials.
10. That all vouchers be properly arranged in consecutive order and filed year by year so that reference can be made to them at any time.
11. That all taxes be paid direct to bank as recommended in report.
12. That a proper record should be kept of all dog taxes.
13. That all rentals collected shall be properly accounted for.

14. That a proper register be kept by the Magistrate of all police court fines and the sums so collected handed to the Treasurer monthly.

15. That all debentures issued on the instalment or annuity plan be figured so that the yearly payments be equal, viz.: Principal increasing and interest decreasing during life of debenture.

CANADA LIFE BUILDINGS, TORONTO, CANADA.

J. W. Sharpe, Esq., Provincial Municipal Auditor, Toronto:

DEAR SIR,—Under authority of an Order-in-Council dated the 23rd day of November, 1909, in the name of our Mr. R. E. Young, we have made an audit of the books, accounts and vouchers of the Township of Mersea covering the period from Jan. 1st, 1899, to Dec. 31st, 1908.

The petition of the ratepayers making request for this investigation set forth the following:

1. That in their belief bonuses or premiums have been received on the sale of debentures issued in connection with the drainage works for the said Township, which said bonuses have not been credited to the respective drainage schemes, but have been placed to the credit of the Township as a whole.

2. That outlay on special drainage work not assessed against Municipality by the By-Laws has been charged up to the Municipality, and which should have been charged against the drainage scheme.

3. That there has been no audit by expert accountants of the said books and accounts within the last twenty-five years, and the said ratepayers set forth that in their opinion and it is their wish that the said examination and audit should extend back for the past tweny-five years.

A preliminary investigation was made towards the close of December, 1909, as the result of which, after conferring with you, it was arranged that the examination should extend over a period of not more than ten years.

As a result of the preliminary investigation it was quite evident that the work of the investigation would necessarily extend over a considerable period of time, and if carried on altogether in Leamington, the travelling and hotel expenses would add largely and unnecessarily to the cost of the work. The Council were agreeable to allowing the books, vouchers, etc., that were not in use to be sent to our office in Toronto, and we were able to carry on the detail of the work up to the beginning of 1908 from the books and vouchers in our possession at a considerable saving in the cost of the audit.

It has been an extensive undertaking and the detail of the work has proved enormous, as the nature of our Report no doubt will prove. In order to follow the transactions from year to year to the point of incorporating the final result of the work in this Report and in the statements connected therewith, it has of necessity become pretty much the work of one man, except in the matter of abstracting the details, and for this reason it has been impossible to carry on the work continuously from day to day, but the work has been progressed as rapidly as possible, and we trust that the results thereof may prove satisfactory to all concerned, and, together with the recommendations herein contained, prove as it should helpful for the future.

Dealing with the clauses of the petition setting forth the reasons for which the investigation was asked, in the order named, we have the following general remarks to make at the outset:

1. The By-Laws authorizing the issue of debentures for all special drainage work, including Pelee Marsh, and for school purposes and local improvements (Wheatley Sidewalks) have been examined and the proceeds from the sale of the debentures traced through the cash books into the various accounts, and we are pleased to be able to state that in all cases where amounts are shown to have been

received over and above the par value of the debentures, the various accounts have received credit for the same. A statement is submitted showing the source and disposition of all moneys received under the special drainage By-Laws coming within the period under investigation.

2. The result of the investigation has proved that the General and Special Funds have at various times been affected by numerous errors and omissions, and quite largely had the General Funds been drawn upon in connection with the Pelee Marsh System. The balance at the credit of the Pelee Marsh Account as at Dec. 31st, 1908, as stated on the Ledger, was $1,870.75. While dealing with the account in the light of what should have been, without regard to interest on balances either way, the credit of Construction and Maintenance Account is reduced to a credit of $5.30, and having regard to interest on balances either way, which in all fairness must in this and in the case of all special accounts be taken into consideration, the balance as at the 31st Dec., 1908, should now be stated as a debit of $807.19, which means a net change to the benefit of the General Funds of the Township of $2,677.94.

In connection with the other special drainage accounts a statement is submitted, showing the errors and omissions as a result of this investigation, and, in addition, interest has been calculated on the balances either way and the corrected balances taken into the statement of Assets and Liabilities and shown in statement in detail herewith. In this connection also we might add that under authority from the Council a corrected Ledger in detail of all drainage accounts is being prepared by us, and will form the basis of these accounts at and from Dec. 31st, 1908.

Clerk.

Mr. Alfred Hairsine, the present occupant of this office, has been the Clerk of the Municipality throughout the whole period covered by this investigation.

Treasurer.

Mr. W. G. Morse was occupant of this office during the period of this investigation to the end of September, 1908, when Mr. J. J. Latam was appointed to the office.

Cash Book and Cash Transactions.

The usual form of Municipal Cash Book was in use, but owing to the method of carrying on the cash transactions, very much of its usefulness was destroyed. What should have been the invariable practice of depositing all money as received and paying only by cheque, proved to be the exception rather than the rule, and the bank columns were altogether disregarded. In addition to this, money, when deposited, was placed at times in as many as three or four different banks and again divided as between Current Account and Savings Bank Account without any distinct connecting link with the Cash Book, and this, together with the practice of paying sums aggregating a large amount out of cash in hand, rendered it impossible to check continuously the bank transactions with those in the Cash Book. We were forced to adopt the principle of charging the Treasurer with all cash received, using every evidence possible, direct and indirect, to verify the Cash Receipts, and credit the Treasurer under authority of proper vouchers for all disbursements.

We are of opinion that this unsatisfactory method of banking arrangements can be largely attributed to the practice in vogue up to the beginning of the year 1903, that of allowing the Treasurer, in addition to his salary, the interest earned on deposits. Under By-Law 679, passed on Jan. 19th, 1903, reappointing Mr. Morse as Treasurer, this practice was discontinued, the clause in the By-Law referred to being as follows: "And it is further enacted that the practice heretofore existing of allowing the Treasurer to retain the interest received by him on Township moneys deposited in the banks as an addition to his salary be approved and confirmed, but that in future such practice be discontinued." We need hardly point out how injuriously such a practice might affect the cash transactions of a Municipality if in the hands of a Treasurer whose mercenary spirit outweighed the moral appreciation of his duty, but we are glad to be able to say in this case that we have been unable to find any evidence that the Treasurer has profited by the practice other than he was justly entitled so to do under the arrangement. The balance of cash on hand at Jan. 1st, 1899 (as in the case of all other balances at that date except where subsequent evidence has proved their inaccuracy) we have assumed to be correct. The subsequent transactions to the 31st Dec., 1908, have been carefully scrutinized and checked with the vouchers and other evidence obtainable, and, subject to several minor errors which have been adjusted, were found to be correct with the following exception: On August 1st, 1902, the Treasurer received the proceeds from the sale of Debentures of the 2nd Concession Drain, By-Law 659, Principal $425.00 and a Premium of $5.00, making in all $430.00. The Bank Book on the following date showed a deposit of this amount, and the Drainage Account in the Ledger was credited with the full amount, but in some way or other which cannot now be explained an error was made by taking the amount to debit in the Cash Book at only $330.00, so that it has been found necessary to charge the Treasurer as at Aug. 1, 1902, with this short debit of $100.00, which must be collected from him with interest added to date of payment. As the drain received the credit at the proper time and interest has been calculated on the drainage account on that basis, this amount, when received, will be placed to the credit of Mr. Morse to balance his account, and the interest credited to General Fund.

On June 30th, 1908, a cheque was issued by the Treasurer in favor of himself for $187.58 to retire the installment of Principal and Interest of the Hillman Drain Debenture due in September, 1908, but this payment was not entered in the cash book until September on the date when the Debenture fell due. Mr. Morse explains that he needed this money for some specific purpose at the end of June and issued the cheque with the knowledge of the Council, but the security was apparently not surrendered until September. The Clerk is able to substantiate the explanation from Mr. Morse, but there appears to be no reference to the transaction in the Minutes. It seems to us that to make this transaction regular the Council should have required the security to have been surrendered at the time the check was issued, and charged Mr. Morse interest for the payment in advance.

There was very little available evidence in the form of vouchers preserved from which to verify the cash receipts. We made use of what vouchers there were as far as possible, and supplemented the evidence available from this source by reference to the various Debenture By-Laws and independent statements which we were able to procure during the course of the audit. For the Disburse-

ments, with the exception of the cancelled Debentures, the vouchers for the most part consisted of the order on the Treasurer based on the authority of the Minutes and endorsed by the person in whose favor the order was issued.

Our recommendations will include a form of voucher for Receipts as well as Payments which will fill requirements in a more satisfying manner than those with which we have had to deal, and also instructions regarding the entries in the Cash Book calculated to preserve a connecting link between the Cash Book and the Bank Account.

Collectors' Rolls.

The Collectors' Rolls have the appearance of being well written up and well kept. They were recapitulated to show the total amount of Taxes on the Roll against the Collector to be collected, and in each year the amount has been accounted for by the Collector with the exceptions of the year 1903 and 1906, the difference being of only small consequence and amounting to one dollar only in each year. In 1903 the difference of one dollar was added by the discovery of an error in addition, and in 1906 the balance unaccounted for was returned to the County Treasurer as one dollar short. The Roll for the year 1906, however, was missing and could not be found. Verification of the total amount of Taxes on the Roll for this year had to be verified from the sworn return of the Clerk, and from his summary we had to work out the credits to the various funds. This worked out satisfactorily except in the case of the credits to the individual rate accounts under Special Drainage, and for this purpose we were forced to assume that the amount required had been produced. The aggregate amount placed to the credit of the various rate accounts on this basis only differed from the total credit on the Roll as per the Clerk's summary by $4.57, which in the nature of things must be regarded as satisfactory. There was no recapitulation on the Rolls in any of the years to show the summary of the amounts raised for the credit of the rate accounts for Special Drainage or otherwise, nor was there any such summary at all, and, so far as the accounts were concerned, it was taken for granted that the credits required for the various rate accounts had been raised, and on the same assumption the Debenture Installments were paid as they came due. In order to satisfy ourselves of the sufficiency or otherwise of the amounts raised by way of assessment for the credit of the various rate accounts, or for special accounts, it became necessary for us to make a complete analysis of the Rolls for each year. The time consumed in compiling these summaries was very considerable. Had the Treasurer been in possession of such a summary each year and passed to the credit of the Special Accounts the amounts produced on the Roll, as should have been the case, a very large portion of the time consumed by this audit would have been saved. As was the case, however, we had neither the summary nor the Accounts in the Ledger, and had to compile both in order to arrive at a result which would be in any way satisfactory.

Our recommendations will cover this deficiency and provide a form of Journal entry to place a summary of the Roll on the Ledger each year, which has not heretofore been done.

In each of the years under review the exact amount required under the By-Law to be raised against Roads has been passed to the credit of the various rate accounts from the General Assessment provided on the Roll of each year for that purpose, and the analyses of the Rolls show that, with few exceptions, the

amounts required to be raised on Lands have been realized. The differences are trifling and it is quite evident that every possible care has been exercised by the Clerk in placing these special assessments on the Roll.

Ledger and Ledger Accounts.

It seems well to place our criticisms of the Ledger close to our remarks on the Collectors' Rolls, as the chief destruction of its usefulness was occasioned by the omission to Journalize the summary of the Collectors' Roll each year and place the entries in the Ledger. This book, which is at all times supposed to contain a summary of all the transactions and a complete record of the affairs of the Township, fails altogether in its purpose, and its incompleteness necessitates an entire reconstruction. Its chief purpose seems to have been to record the transactions on Special Drainage Construction Accounts, with some other special accounts included from time to time for the sake of convenience. Accounts representative of the ordinary transactions of the Township and the rate accounts are noticeable by their entire absence. An effort has, however, been made to keep a record therein of the Drainage Construction Accounts, but as a result of the audit these have been in so many cases changed by the discovery of errors and omissions that we applied to the Council, and, as before stated, have received their authority to supply them with a ledger showing the detail of the various Drainage Construction and other Special Accounts for the period under audit to the corrected balances as at Dec. 31st, 1908. This Ledger, in addition, will contain the balances of all the accounts, entering into the statement of Assets and Liabilities as at Dec. 31st, 1908, and upon our recommendation we understand it is their intention to have the summary of subsequent transactions recorded in these Ledgers and brought up to date. It seemed to us that much of the value of this investigation would be lost to the Township unless this were done, and in this the present Council unanimously agreed. We have their authority to bring the work up to the close of 1909, which is in order, but it remains for the incoming Council to authorize a continuation of the work to the close of 1910.

Special Drainage Accounts.

Reference under this head has to do with all the Special Drainage Construction and Maintenance Accounts other than Pelee Marsh, the extent and importance of which we feel requires a special report. At the outset it must be made quite clear that in connection with all drains constructed or under construction prior to Jan. 1st, 1899, the balances as at that date have been taken as correct, except where subsequent information has proved their inaccuracy, and to this extent the balances have been changed to conform with the facts. Notwithstanding this, however, it was thought advisable and it has been proved necessary to examine not only the Drainage By-Laws for those drains taken up during the period under audit, but also those the balances of which came into the period. The original of all By-Laws had been carefully preserved by the Clerk, who kept also a By-Law book into which the Drainage By-Laws were copied. Some errors and omissions have been made in carrying out the provisions of the By-Laws in the failure to pay over to or receive from interested Municipalities the sums due to or by them in connection with specific drains. and to this special reference will be made later under the drainage accounts affected. Prompt settlement of these amounts due to or by the Municipality

in respect of drainage work seems to have been the exception rather than the rule, and reflects no credit on the officials responsible for such a state of affairs.

An effort has been made to keep a proper record in the Ledger of the Drainage Accounts, and while numerous errors and omissions were discovered which will be to some extent shown by the statement submitted, the result might have been a great deal worse. It has been an exacting work following up the errors and omissions in the various drains and making the necessary changes in the various accounts to bring the results of each to a basis satisfactory from our standpoint and fair and just to the Municipality and to the interested ratepayers. We believe this has been accomplished as far as possible. It seems apparent, however, that at times plank and tile have been furnished out of supplies on hand belonging to the Municipality, which have gone into the repair work in connection with some of the drains. Whatever this represents in amounts it is impossible to analyze and apportion, but it is a matter which must be guarded against in the future, and in every case where supplies bought with the General Funds of the Municipality are used in drainage work, the value of the same must be charged to specific drain and credited to the General Fund.

In the reconstruction of the Drainage Accounts to the balances as at Dec. 31st, 1908, we have calculated interest on the daily balances; 5 per cent. on the debit and 3 per cent. on the credit. In only two drains had interest been taken into account, Big Creek By-Law 757, and North Part of Silver Creek By-Law 700; in which case credit interest had been allowed at 3 per cent. The result in both cases was inaccurate, as it could not fail to be under the method employed, and in the reconstruction of these accounts we have changed the interest to amounts which should be, having regard to both the debit and credit items, in the accounts.

We think there can be no question that the calculation of interest on these Drainage Accounts is a right principle, and if calculated on a proper basis not too difficult a matter to be continued satisfactorily. To do so, however, the Drainage Accounts must first of all be accurately kept and the items entered therein in the order of and under their proper date.

Specific errors and omissions in the following drains we feel require special reference. The adjustments have, however, been made in the accounts themselves, or will be dealt with in the statements of Assets and Liabilities.

Atwell, By-Law 685.

This Drain was taken up under this By-Law in 1903, and at the close of 1904 the account showed a debit balance of $41.86. This balance was written off "By balance overcharged drain" for which there appeared to be no authority, and we have retained the amount in the adjustment of the Account.

A & B Concession, By-Law 602.

The balance at the credit of this Account at the close of 1906 was $18.55, which was written off without any apparent authority, and we have retained this balance in the adjustment of the Account.

B & C Concession, By-Law 539.

Work was undertaken on this Drain in 1902 under present Sec. 76 of the Drainage Act, and an assessment was made on Lands and Roads on the Roll

of that year of $186.49, which was in excess of the amount expended by $95.75. This surplus was proportionately refunded early in 1903 and the Account closed out.

1st Concession, By-Law 584.

In the year 1905 the parties interested took advantage of the presence of a dredge and on petition of all of them the Council granted expenditure incurred, for which special levy was made on the Roll of 1905; on Lands $315.67, on Roads $67.43, in all $383.10, which covered the expenditure. The drain was taken up in 1907 under By-Law 755.

2nd Concession, By-Law 569.

The balance to the credit of this Account at the close of 1903 was stated in the Ledger Account as $81.00, which was closed out on that basis in 1905 by proportionate refund. The balance was wrongly stated, however; it should have been $91.00, and the difference of $10.00 has been retained in the adjustment of the Account.

11th Concession, By-Law 738.

This Drain was taken up in 1906 and under the By-Law the Township of Tilbury West was assessed $25.00 for a bridge, which amount has not been paid. This remains an asset of the Township applicable to this Drain and should be collected with interest at 5 per cent. to date of payment. Tilbury West states that they have no record of ever having been served with notice of assessment on this Drain. If they can prove this contention and can now legally refuse to pay the amount, then the amount, together with interest, must be collected from the person or persons responsible for the oversight.

Dales Robb, By-Law 780.

This is a Drain of Tilbury West taken up in 1908, the assessment in this case being for bridge. The assessment for the drain itself was provided for in 1903 under By-Law 693. The assessment under By-Law 780 was $204.00 less expenses allowed of $42.00, leaving a balance due Tilbury West of $162.00, which has not been paid over to Tilbury West. It stands as a liability against the Drain with interest at 5 per cent, until paid.

Fox, By-Law. 748.

This account was closed out in 1907 by applying the surplus of $140.15 in reduction of assessment to meet debenture payment. After calculating the interest on the Account the net result was so small that we considered it unnecessary to open up the Account again to record the amount, which was less than $2.00

McCracken Repairs, By-Law 480.

In 1907, this Drain was repaired under present Section 76 of The Drainage Act, and on the Roll of that year the assessment was made against lands and roads as under By-law 480. In repairing the Drain, however, the Commissioner repaired above the point provided under the By-law, the cost of which was included

in the assessment. In 1908, rebates were made under resolution of the Council to owners of lands in area under the By-law, to the amount of $38.89, which was calculated to represent the amount expended on repair in the area outside the By-law.

Ogle, East Part, By-Law 629 and By-Law 678.

Under By-law 629, Tilbury West, was assessed $60.00, but this was not paid over to Mersea until 1904, when on December 22nd of that year the amount was paid, together with interest of $34.32, amounting in all to $94.32. This amount was never credited to the account, but has been taken into consideration in the reconstruction of the account, offsetting the balance at the debit of the account under By-law 629, and the net result in the adjustment should be satisfactory to all concerned. The assessment from the Roll of 1908 under By-law 678 which was calculated at the time to provide for the overdraft, was over-credited to the extent of $39.07.

Reid and Outlet, By-Law 741.

In the year 1906, an amount of $400.00 which should have been charged to this drain was in error charged to North Part of Silver Creek, By-law 700, which has, of course, been adjusted in the reconstruction. There were other errors and omissions which have been adjusted but this item alone makes quite a change in the complexion of these two accounts. Under this By-law Tilbury West, was assessed $50.00, which has not been paid to Mersea and which must be recovered, together with interest to date of payment.

Ruscom and Silver Creek, By-Law 669 and By-Law 677.

This is a Drain of the Township of Rochester, and the first assessment was appealed against by the Township of Mersea. The appeal was settled under agreement confirmed by the Referee under which each party was to pay their own costs, to be assessed proportionately against lands and roads. This assessment was made on the Roll of 1902, under By-law 669, but the account was under-credited $5.94. In 1903, Rochester's assessment was taken up under By-law 677. The Drainage account on the ledger was closed out in 1905 by applying the surplus there stated to the reduction of the assessment to meet debenture, but the errors and omissions discovered, together with the calculation of interest, leave a balance at the debit of this drain as shown in the statement of Drainage Balances.

North Part of Silver Creek, By-Law 700.

This Drain was charged in the year 1906 with an amount of $400.00 which should have been charged to Reid and Outlet By-law 741, as reported thereunder. The several other errors and omissions will be seen on the statement dealing therewith.

This is one of the drains in which an attempt was made to calculate interest as there was a considerable credit balance carried from 1904, to the beginning of 1908, but owing to the method employed in calculating the interest, the amount credited in the ledger account fell far short of what it should have been. In the adjustment and reconstruction of the account the matter of interest has been dealt with on the principle applied to all other drains.

Sloan or Ruscom, By-Law 681.

Under this By-law passed in 1903 Gosfield North was assessed $45.00, which amount has not been paid over to Mersea and must now be collected, together with interest at 5 per cent. to date of payment. The Treasurer of Gosfield North can find no record of it having been paid. The overdraft on the account was closed out in 1908 by a proportionate assessment on the Roll against lands and roads. The balance at the credit of the drain as appearing in the statement of Drain Balances, is a result of the calculation of interest and will be increased by the amount to be received from North Gosfield.

Wyatt By-Law 569 and By-Law 788.

The account under By-law 569 was closed out in the year 1900 by refund of the surplus. In 1905, under By-law 717, the drain was again taken up, but although the work was let several times it was never carried out. The account was taken up under By-law 788, in 1908, and the work was in process of being carried out at the close of that year. Under By-law 788, Tilbury West was assessed $109.50, which had not been paid over before the close of 1908, and we believe has not yet been received. The amount must be collected, with interest at 5 per cent. to date of payment.

In a copy of the statement furnished by Tilbury West, the amount due on the Wyatt Drain is shown as $95.00, with interest from August 8th, 1905, but this would appear to be the amount assessed against Tilbury West under By-law 717, which was not carried out.

No. 7, or Two Creeks, By-Law 595 and By-Law 635.

A drain of the Township of Romney. In 1899, under By-law 595, the account was closed out by writing off a credit balance of $6.00, but without authority of any voucher. A further assessment was made in 1900, and taken up under Mersea By-law 635. This time the account was closed out by writing off a credit balance of $35.80, but again, without authority of any voucher. In the amount of $35.80 was a charge for Clerk's fees of $15.00, but this was not paid and under the By-law is owing to the Clerk.

No. 12, or Two Creeks, By-Law 704.

A drain of the Township of Romney. The ledger account showed a credit balance of $10.00, but the drain was overcharged $11.25, without authority of voucher. The credit balance at close of 1908 with interest should be $25.55.

No. 21, or Village By-Law 612

A drain of the Township of Romney. By-law to provide for assessment made in 1898. The account was closed out in 1900, by charging the drain with $42.37, which balance was not expended. In 1906, Romney made an assessment of $61.00 which was charged to the drain and stood as a debit of that amount on the ledger at the close of 1908.

Pelee Marsh System.

This drainage work was first taken up in the year 1894, under By-law No. 523, which was finally passed on April 27th of that year. Its commencement was five years previous to the period covered by this audit, but its extent and importance warranted an analysis of the operations from its inception.

The debentures authorized under By-law 523 amounted to $22,844.00. Of this amount $19,500.00 was issued on July 4th, 1894, and the account credited with the proceeds, which amounted to $20,549.28; and the balance of $3,344.00 was issued on July 18th, 1898, the first three debentures being cancelled, and the proceeds amounting to $2,908.00 were placed to the credit of the account. Under this By-law provision was made for an assessment against lands and roads for maintenance and repair to the extent of $500.00, but this, as accompanying statement will show, was altogether insufficient to meet requirements, and this portion of the By-law was amended in 1899 by By-law 630, which provided for an assessment for maintenance of $2,500.00 a year.

Repairs and improvements to the scheme were undertaken in 1903, under By-law 690, which authorized debentures to the extent of $13,721.90, which were disposed of on December 19th of that year, and the proceeds amounting to $14,245.85 placed to the credit of the account. In carrying out the work under this By-law difficulties were met with, which occasioned a change in plan not provided for under the By-law, and it became necessary to cut off a part of the scheme and grant compensation in the amount of $4,000.00 to one Allister McKay, whose lands were affected by the change. The work of improvement within and without the provisions of the By-law, together with this compensation and deficit under previous operations, left the scheme so largely indebted to the general funds of the Township that application was made to the Legislature for an Act authorizing a consolidation of the debt confirming the expenditure already made, and the agreement entered into with Allister McKay compensating him to the extent of $4,000.00. This Act was passed at the 1st Session, 11th Legislature, 5 Edward VII., 1905, and is cited as "The Point Pelee Marsh Debenture Act, 1905." Under authority of this Act, By-law 719 was passed on June 19th, 1905, authorizing the issue of debentures to the amount of $45,000.00. Of this amount $42,500.00 was issued, the balance of $2,500.00 remaining unissued, as it was found impossible to arrange for an exchange of the outstanding debentures of the 2nd issue, under By-law 523. The proceeds realized from the sale and exchange of the debentures issued and the disposition thereof will be shown later in the statement showing the result of the consolidation.

The charges and credits, including the assessments to meet debentures and the debenture payments, had all been charged to one account, and the amount of the assessment required each year, both for the rate account and the maintenance, was placed to the credit of the account, irrespective of whether the amount required had been actually raised or not. This manifest error, together with other numerous errors and omissions, made a reconstruction of the account necessary before any accurate result could be arrived at, and in its reconstruction we have passed the assessments for debentures to the credit of rate account, charging that account with the debenture installments.

In an analysis of the general account we have used every effort to divide as far as possible the expenditures under two divisions, Construction and Maintenance, and for the purpose of showing wherein lay the chief cause of deficit which was consolidated in 1905, we submit the following summaries:—

CONSTRUCTION.

		Dr.	Cr.
1894.	Proceeds 1st Issue of Debentures, By-law 523		$20,549 28
	Charges	$10,364 82	
1895.	Charges for Construction	7,027 08	
	Rate Account to meet Debenture No. 1, due June 15, 1895, not assessed for	1,564 88	
1896.	Charges for Construction	6 75	
1898.	Proceeds 2nd Issue of Debentures, By-law 523		2,908 00
	Surplus at credit of Rate Account, Dec. 31, 1898, after providing for Debentures due 1899		805 08
1903.	Proceeds sale of Debentures, By-law 690		14,245 85
	Charges for Construction	424 42	
1904.	Charges for Construction	15,189 75	
	McKay compensation	4,000 00	
	Rate Account, for deficit *re* Lots 19, 20 and 21, Con. C	256 97	
1905.	Grant from Legislature		2,000 00
	Rate Account, deficit *re* Lot 12, Con. C	50 88	
	Rate Account, deficit *re* Lots 19, 20 and 21, Con. C	307 80	
	Rate Acount to meet Debenture No. 2, due Nov. 1, 1905, not assessed for	1,777 12	
	Charges for Construction	7,562 61	
		$48,533 08	$40,508 21
	Net Deficit		$8,024 87

MAINTENANCE.

1895.	Assessment		$500 00		
	Charges		1,344 47	Deficit....	$844 47
1896.	Assessment		$500 00		
	Charges		1,740 10	Deficit....	1,240 10
1897.	Assessment		$500 00		
	Charges		2,303 21	Deficit....	1,803 21
1898.	Assessment		$500 00		
	Charges		2,605 45	Deficit....	2,105 45
1899.	Assessment		2,474 75		
	Charges		2,124 69	Surplus...	350 06
1900.	Assessment		2,474 75		
	Charges		1,076 53	Surplus...	1,398 22
1901.	Assessment	$1,484 83			
	Sale of Material	5 00			
			1,489 83		
	Charges		1,150 57	Surplus...	339 26
1902.	Assessment		989 88		
	Charges		1,858 32	Deficit....	868 44
1903.	Assessment		2,476 19		
	Charges		8,400 25	Deficit....	5,924 06
1904.	Assessment	$2,164 76			
	Sale of Material	3 00			
			2,167 76		
	Charges		3,773 64	Deficit....	1,605 88
1905.	Assessment	$1,280 96			
	Sundry Credits	145 00			
			1,425 96		
	Charges		1,064 85	Surplus...	361 11
	Net Deficit				$11,942 96

The total net deficit at the close of 1905 was as follows:

Construction	$8,024 87
Maintenance	11,942 96
	$19,967 83

This deficit, together with the principal of Debentures outstanding under By-law 523 and By-law 690, was absorbed in the Consolidation Account, which for illustrative purposes mught be stated as follows:—

CONSOLIDATION ACCOUNT.

1st Issue under By-law 719	$20,000 00	$20,000 00	
Premium		1,853 00	
Accrued Interest		391 78	
			$22,244 78
2nd Issue under By-law 719	$11,500 00	$11,500 00	
Accrued Interest		385 30	
			11,885 30
3rd Issue under By-law 719	$11,000 00	$11,000 00	
Accrued Interest		456 58	11,456 58
Total Issue	$42,500 00		
Total Proceeds			$45,586 66
Against which must be charged the following:			
Outstanding Principal of Debentures, By-law 523	$11,119 68		
Accrued Interest	300 06		
		$11,419 74	
Outstanding Principal of Debentures, By-law 690		11,485 23	
Deficit Construction Account		8,024 87	
Deficit Maintenance Account		11,942 96	
			$42,872 80
Leaving Surplus to credit of Account as result of Consolidation of			$2,713 86

The result of the Consolidation left a balance at the credit of the Account of $2,713.86 at the close of 1905, and the charges and credits to the Account since that date to the close of 1908 may be summarized as follows:

		Dr.	Cr.
1906.	Balance after Consolidation		$2,713 86
	Additional amount received *re* Exchange of Debentures...		250 00
	Sale of Material		63 80
	Assessment for Maintenance		1,267 51
	Charges for Maintenance	$2,100 35	
	Charges for Construction	415 50	
1907.	Grant from Legislature		3,000 00
	Sale of Material		30 00
	Assessment for Maintenance		1,267 51
	Charges for Maintenance	2,021 48	
	Charges for Construction	575 00	
1908.	Refund of Expenses		12 60
	Assessment for Maintenance		1,267 51
	Charges for Maintenance	1,431 80	
	Charges for Construction	394 00	
	Rate Account, to meet Debenture No. 3 not assessed for in 1907	2,929 36	
		$9,867 49	$9,872 79
	Net Credit Balance	5 30	
		$9,872 79	$9,872 79

The figures given in the following summaries are as a result of working out the account without considering the question of interest to the account for the period. The net debt of interest to the account for the period amounts to $812.49, which leaves a debit balance in the account at the close of 1908 of $807.19.

Perusal of the summary of Assessments for Maintenance and the charges against such assessment for each year will prove how far short these assessments have been of the average amount required. The expenditure in 1903 was so largely in excess of the average that it called forth special inquiry on our part, and the explanation from the Clerk in writing is as follows:—

"In December of 1902 a serious break occurred in the embankment at the north side near Pelee Creek. This flooded the whole scheme and before the break could be entirely stopped the fuel on hand was all gone. Early in the Spring of 1903 the south bank along the McKay lands commenced sliding in and it kept sliding in practically all that year, which made it necessary to operate the pumps practically all the time. In the Fall of 1903 or late summer, they thought it best to have an extra quantity of coal on hand for fear of being caught short again, because it costs a good deal more to deliver coal in such a place in the winter or spring owing to bad roads." We made close analysis of the payments for this year, and the excess above the average can quite readily be attributed to the expenditure in repairing the breaks in the embankment and for the extra supply of fuel.

It does not seem necessary to review in detail the transactions in the Account prior to the consolidation in 1905, but we most strongly bring to the attention of the authorities that in future deficits on account of Maintenance and Repair should not be allowed to accumulate. It is imperative that this expenditure should be retired by assessment from year to year.

Rate Account.

The balance at the credit of Rate Account at Dec. 31, 1908, was $2,619.70, which was short of the amount required to meet the Debenture Installment falling due in 1909 by $413.35, made up as follows:

Year 1905	103 68
Year 1906	103 69
Year 1907	103 69
Year 1908	102 29
	$413 35

This shortage will occur every year during the currency of the balance of the outstanding Debentures under By-Law 523, which the holder thereof would not exchange. The total Debenture Installment payable each year is $3,033 05
while the assessment for the credit of the Rate account provided under By-law 719 amounts to 2,929 36

Conclusion.

Within the limits of a single Report one cannot do much more than summarize the results of transactions of an Account containing such a mass of detail. The errors and omissions which have been found possible to creep into the less extensive drainage accounts, have been multiplied by the greatly increased detail

in this case. The net result of the adjustment has been to change the credit balance, as previously stated on the Ledger at Dec. 31st, 1908, as $1,870.75 to a debit balance of $807.19, making a net change to the benefit of General Funds of $2,677.94.

Award Drains.

The several Award Drain transactions have been examined. The examination shows that the assessments made have been paid to the Treasurer, or placed upon the Collectors' Rolls in the proper manner, with the following exceptions:—

Mills Award, 1905	$30 00
Costs of Appeal	15 10
	$45 10
On Roll of 1905	43 75
Shortage	$1 35
Add Interest (7% on $45.10)	3 15
Total Shortage	$4 50

which has been charged against the Clerk.

Murray Smith Award, 1907	$34 00

This was found to have been overlooked altogether but we understand has been placed on Roll 1910.

The balance at the Debit of Award Drains Account, Dec. 31, 1908. is $104.00, made up as follows:—

McKay Award	$33 00
La Marsh Award (Balance)	28 00
Reid Award (Balance)	9 00
Murray Smith	34 00
	$104 00

Fence Viewers' Fees.

Examination proves that assessments made have in due course been either paid to the Treasurer, or placed on the Collectors' Rolls, and at the close of 1908 there was no balance outstanding.

Tile Drainage.

The required assessments have been placed upon the Roll of each year with exception of amount due re No. 4, on House of Refuge site. The County in 1905 settled the amount due to close of 1904 and the Rate Account was credited. In 1909 they have made a settlement up to and including year 1909. At the close of 1908 we therefore debited the County with the proportion due to show the correct liability in the Rate Account.

In the case of one of the Debentures the Assessment is made and Debenture Installment paid in the same year. For this reason the Rate Account liability at the end of any year is $7.36 less than the aggregate of Installments paid in the year following.

Arrears of Taxes.

The asset for Non-Resident and Arrears Taxes at the close of 1898 was stated in the Auditor's Report of that year as $282.38, but subsequent investigation proved this amount to have been understated by $236.36, verifying the asset on this Account at Jan. 1st, 1899, as $518.74. The transactions in this account have been carefully examined throughout the period under audit, and verified from statements in the hands of the Clerk and Treasurer, and by access to the County Records; and the balances verified as at Dec. 31st, 1908, in accordance with the statement herewith. The variations as shown by the statement will have to be dealt with and accounted for.

Wheatley Sidewalk Construction.

Cement sidewalks were constructed in the Village of Wheatley under By-law 674 in the year 1902 and under by-law 730 in the year 1905. In 1908, the balances at the credit of the Construction Accounts were as follows:—

By-law 674	$42 29
By-law 730	40 78

A petition was presented to the Council in this year, signed by a majority of those assessed for the walks, consenting to the payment of that portion of the surplus belonging to the parties assessed to the Trutees of Union School Section 4 and 12, for the purpose of assisting in a construction of a cement walk to the school, and on the authority of a resolution of the Council, a check was issued for $50.00, one-half to be charged against each of the Construction Accounts and the balance remaining to be transferred to the Township Account,, as representing the proportionate interest to the Township as a whole. The division was accurate enough to be regarded as satisfactory and while the Accounts were not closed out on the Ledger, this has now been done.

Leamington and St. Clair Railway Bonus.

Under by-law 383 which received the assent of the electors on Feb. 8th, 1886, and was finally passed on Feb. 15th, 1886, a bonus of $15,000.00 was granted to aid in the construction of the above railway. As far as can be ascertained, the Debentures were sold at par on or about Sept. 18th, 1886, and the proceeds handed to Trustees.

The assessment to meet the Debentures was a general one against Lands throughout the Township. A specific rate was placed upon the Roll each year, with the exception of 1889, in which year the amount required appears to have been raised in the general assessment for Township purposes, but as the final result was the same, this does not seem to be of very great consequence. In a settlement made under agreement with the Town of Leamington in 1890 the Town was to pay annually on this Account to the Township of Mersea the sum of $22.51. The balance due on Jan. 1st, 1899, was $180.08, settlement of which has since been made. The last Debenture under the by-Law fell due and was paid in 1906.

Robert Coultis Estate Payment.

Under the will of the late Robert Coultis, who died on or about the 5th day of December, 1892, the residue of his estate was to be held in trust by his executors and the interest derived therefrom paid annually in equal shares to the Township of Mersea and the Town of Leamington, for the benefit of

the poor in these municipalities. The annual payment received from 1897 to 1900 was $250.00 and from 1901 to 1908, $200.00, with the exception of the year 1907 in which no payment was received. In answer to inquiry Mr. Wigle, one of the executors, states that payment was not made in 1907 to either the Township of Mersea or the Town of Leamington on account of losses sustained. We have no knowledge, of course, what occasioned the losses mentioned and therefore cannot give an opinion on the matter, but we think it is a case that might be referred to the Solicitors of the Township.

School Purposes.

There was no record on the Ledger of the annual levies for school purposes. These we have dealt with by placing the amount produced on the Roll each year to the credit of School Levies Account and charging this Account with payments made to the school sections. The balance at the credit of School Levies Account at Dec. 31st, 1908, was $2,296.32, which is accounted for as per statement herewith.

Rate Accounts had also to be constructed for the special levies in connection with the School Debenture Assessments and a statement of the balances as at Dec. 31st, 1908, is herewith. In error an assessment was made on the Roll of 1908 for School Section No. 10 Rate Account, part of which was refunded the same year and the balance appearing at the credit of this Rate Account represents the liability at the close of 1908 which has since been refunded.

Recommendations.

1. That all cash received be entered promptly in the Cash Book and in order of proper date.

2. That the full amount of all cash received be deposited not later than the day following receipt thereof.

3. That all payments be made by check only, payable to order.

4. That payments, except those fixed by By-law or Statute, shall be made only on authority of warrant signed by the Reeve, and that all warrants issued and amount thereof shall be entered in the Minutes.

5. That all payments shall be entered promptly in the Cash Book in the order of and under proper date.

6. That an official form of numbered receipt, with stub, shall be adopted, which the Treasurer shall use to acknowledge all monies received.

7. That an analysis shall be made on the Collector's Roll each year to show the division to the various accounts of the Taxes thereon.

8. That a copy of the analysis of the Collector's Roll shall be furnished to the Treasurer, who shall journalize the same, along the lines of the form of journal entry submitted, and post items to the proper accounts in his Ledger.

9. That a Journal shall be provided and that the Treasurer shall be instructed in the manner of making the necessary Journal entries therein and posting the items to his Ledger accounts.

10. That prompt settlement be made and obtained of all amounts due to or by other Municipalities in respect of drainage assessments.

11. That settlement of all other accounts owing to or by other Municipalities be made or obtained as promptly as possible and not less frequently than yearly.

12. That upon the passing of any By-law or Resolution requiring payment at some future date to or by some other Municipality, individual or company, by or to the Township of Mersea, the Treasurer be forthwith furnished with particulars

thereof and that it shall be his duty to see that payment is made or received in accordance with the provisions of the By-law or Resolution.

13. That it shall be the duty of the Treasurer to report at the first meeting of the Council any payment due which has not been received by the date specified.

14. That in connection with all payments to or by Municipalities Section 294A of the Consolidated Municipal Act be strictly adhered to.

15. That a special Minute Book be provided in which to record the Minutes of all Courts of Revision on the assessment Rolls and special drainage or other By-laws, and particulars of the decisions of the Judge or Referee in reference to all appeals.

In Conclusion.

While the result of the investigation has proved that the method of keeping the books and accounts of the Township has resulted in numerous errors and omissions, the discovery of which has led to adjustments of considerable importance to the standing of the various accounts, we are pleased to be able to say that there is no evidence to call in question the honesty and integrity of the officials.

We have to thank the Reeve, Council and officials for their assistance which was always willingly given throughout the prosecution of the audit whenever required, and we wish especially to record our appreciation of the valuable assistance rendered by Mr. Alfred Hairsine, the Clerk, without whose assistance the solution of some matters would have been very difficult and perhaps impossible. The demands made upon his time were considerable, but his assistance was always cheerfully and willingly given.

We hope that the results of this investigation may prove of value to the Township, not alone in the matter of results accomplished, but also as a guide for the officials in the future.

If called upon, we shall be pleased to render any further assistance in our power to the officials in assisting them to carry out the recommendations which we have made, or to explain any matters which may not have been made quite clear in this Report.

All of which is respectfully submitted,

Faithfully yours,

MAITLAND YOUNG AND SON, RALPH E. YOUNG,
Chartered Accountants.

Toronto, Dec. 27th, 1910.

TOWNSHIP OF MERSEA.

List of Schedules.

1. Proceeds realized under Special Drainage Debenture By-Laws, and disposition thereof.
2. Errors and omissions in Special Drainage Accounts.
3. Analysis of School Levy Balance.
4. Details of Arrears of Taxes.
5. Details of balance Current Rate Accounts.
6. Details of balance Special Drainage Accounts, showing result of Interest calculations.
7. Special Drainage Debenture Debt.
8. Tile Drainage Debenture Debt.
9. School Loan Debenture Debt.
10. Wheatley Sidewalks Debenture Debt.
11. Pelee Marsh Debenture Debt.
12. Assets and Liabilities.
13. Details of "Other Assets."
14. Details of "Other Liabilities."
15. Form of Journal entry of Collector's Roll.

STATEMENT SHOWING PROCEEDS REALIZED UNDER SPECIAL DRAINAGE DEBENTURE BY-LAWS AND DISPOSITION OF PROCEEDS FROM JANUARY 1ST, 1899, TO DECEMBER 31ST, 1908.

No. of By-Law.	—	Year Passed.	Principal	Commuted.	Par Value Debentures Issued.	Premium Received.	Accrued Interest.	Total Credit to Drain.
623	10th Concession	1899	836 00	138 90	697 10	10 00	.....	846 00
628	Ogle, West Part	1899	1,438 00	147 60	1,290 40	23 00	.....	1,461 00
629	Ogle, East Part	1899	899 00	.....	899 00	10 00	.....	909 00
635	No. 7 or Two Creeks	1900	1,179 20	110 00	1,069 20	10 80	.....	1,190 00
639	Coulson	1900	625 00	.....	625 00	10 00	.....	635 00
650	Sylvester Wiper	1901	1,517 00	291 00	1,226 00	13 90	.....	1,530 90
659	2nd Concession	1902	425 00	.....	425 00	5 00	.....	430 00
664	Silver Creek, South Point	1902	807 00	.....	807 00	10 00	.....	817 00
668	Ogle 10th Concession	1902	403 00	.....	403 00	5 00	.....	408 00
675	Ruscom. No. Gosfield	1903	487 05	.....	487 05	5 00	.....	492 05
677	Ruscom, Rochester	1903	5,494 08	.....	5,494 08	83 92	46 65	5,624 65
678	Ogle, East Part	1903	2,658 00	.....	2,658 00	42 00	.....	2,700 00
681	Sloan or Ruscom	1903	1,195 00	.....	1,195 00	15 00	.....	1,210 00
684	Piggott Creek	1903	1,452 00	.....	1,452 00	20 00	.....	1,472 00
685	Atwell	1903	1,041 00	.....	1,041 00	15 00	.....	1,056 00
693	Dales Robb	1903	2,144 00	50 00	2,094 00	30 00	.....	2,174 00
697	Chase	1904	1,325 00	283 00	1,042 00	15 00	.....	1,340 00
700	Silver Creek	1904	8,469 00	.....	8,469 00	79 00	92 80	8,640 80
704	No. 12 or Two Creeks	1904	751 60	72 50	679 10	10 00	.....	761 60
705	Goslin	1904	1,307 00	177 00	1,130 00	15 00	.....	1,322 00
725	Irwin	1905	487 55	85 00	402 55	6 00	.....	493 55
731	B. & C. Concession	1905	620 00	.....	620 00	6 00	.....	626 00
735	Collision	1906	996 00	.....	996 00	15 00	.....	1,011 00
738	11th Concession	1906	1,353 00	157 00	1,196 00	15 00	.....	1,368 00
739	Bailey	1906	913 00	.....	913 00	12 00	.....	925 00
741	Reid Outlet	1906	4,313 00	.....	4,313 00	43 00	.....	4,356 00
743	Wilkinson Shilson	1906	4,383 00	547 00	3,836 00	38 00	.....	4,421 00
744	Stevenson	1906	1,042 00	.....	1,042 00	10 00	.....	1,052 00
748	Fox	1906	1,123 00	.....	1,123 00	11 00	.....	1,134 00
755	1st Concession	1907	2,004 00	.....	2,004 00	20 00	.....	2,024 00
756	Hillman	1907	812 00	.....	812 00	6 00	.....	818 00
757	Big Creek	1907	5,047 50	.....	5,047 50	.....	47 00	5,094 50
759	Coulson	1907	3,122 00	.....	3,122 00	28 00	.....	3,150 00
781	B. & C. Concession	1908	1,159 50	.....	1,159 50	5 00	.....	1,164 50
788	Wyatt	1908	1,940 50	.....	1,940 50	10 00	.....	1,950 50
	Totals		$63,768 98	$2,059 00	$61,709 98	$652 62	$186 45	64,608 05

TOWNSHIP OF MERSEA.

Statement of Errors and Omissions in Special Drainage Accounts.

		Debit Drain.	Credit Drain.
Atwell:			
1899	Error stating balance	$0 07	
	Keeping open mouth of drain	5 00	
1900	" " " "	5 00	
1901	" " " "	5 00	
1902	" " " "	5 00	
1903	" " " "	5 00	
1904	" " " "	5 00	
1905	" " " "	5 00	
	Credited by overcharge—no authority	41 79	
1906	Keeping open mouth of drain	5 00	
1907	" " " "	5 00	
1908	" " " "	5 00	
		$91 86	
Big Creek, By-law 537:			
1900	Omitted to be charged	$3 00	
Big Creek, By-law 562:			
1905	Error stating balance		$15 00
Big Creek, By-law 579:			
1901.	Omitted to be charged	$26 00	
1903	Charged in error—should be chgd. to Ruscom, Rochester		$7 40
Big Creek, By-law 757:			
1908	Charged twice in error		$12 00
Chase:			
1904	Omitted to be charged	$25 00	
1905	Omitted to be credited		$30 45
Collison:			
1906	Charged Coulson in error	$7 14	
1907	" " "	2 25	
	" " "	4 50	
		$13 89	
Coulson:			
1906	Charged in error—should be charged to Collison		$7 14
1907	" " " " "		2 25
	" " " " "		4 50
	Omitted to be charged	$6 00	
		$6 00	$13 89
A and B Concession:			
1900	Charged in error—should be B and C Concession		$6 00
1906	Charged in error—should be Pelee Marsh		26 00
1907	Charged in error to close account		18 55
			$50 55
B and C Concession:			
1899	Keeping open mouth of drain	$6 00	
1900	Charged A and B Concession in error	6 00	
1901	Keeping open mouth of drain	6 00	
1903	" " " "	6 00	
1904	" " " "	6 00	
1905	" " " "	6 00	
1906	" " " "	6 00	
1907	" " " "	6 00	
1908	" " " "	6 00	
		$54 00	

1st Concession:		
1907 Error stating balance		$4 10
2nd Concession:		
1903 Error stating balance		$10 00
11th Concession, By-law 738:		
1906 Omitted to be charged	$12 00	
Dales Robb:		
1904 Error stating balance		$7 00
1908 Assessment on Lands and Roads not credited		189 00
		$196 00
Lebo Creek:		
1900 Charged in error—should be charged to Silver Creek, By-law 543		$38 00
1908 Omitted to be charged	$2 00	
Lundy:		
1907 Charged Stevenson in error	$5 00	
McCracken Repairs:		
1906 Omitted to be charged	$3 00	
Ogle, 10th Concession:		
1904 Omitted to be charged	$10 00	
Ogle, East Part:		
1899 Charged in error—should be Ogle, West Part		$42 00
1900 Charged Ogle, West Part, in error	$15 00	
1904 Omitted to be charged	10 00	
Omitted to be credited		94 32
1908 Overcredited *re* Assesment, 1908	39 07	
	$64 07	$136 32
Ogle, West Part:		
1899 Charged Ogle, East Part, in error	$42 00	
1900 Charged Robson Creek in error	14 15	
Charged in error—should be Ogle, East Part		$15 00
	$56 15	$15 00
Reid and Outlet, By-law 741:		
1906 Charged Silver Creek, North Part, in error	$400 00	
Charged in error—should be Silver Creek, North Part		$18 00
Error, stating balance		29 60
	$400 00	$47 60
Robson Creek:		
1900 Charged in error—should be Ogle, West Part		$14 15
Error, stating balance		30 00
		$44 15
Ruscom, North Gosfield:		
1903 Charged to close account in error		$11 00
Ruscom, Rochester:		
1902 Omitted to be charged	$3 50	
Short credited re Assessment, 1902		$5 94
1903 Omitted to be credited		3 76
Omitted to be charged	1 12	
Charged Big Creek, By-law 579, in error	7 40	
Charged to close account in error		52 78
1905 Omitted to be credited		16 00
	$12 02	$78 48

Silver Creek, North Part:			
1900	Charged Lebo Creek, in error	$38 00	
1903	Error stating balance	50	
1904	" " "		80
1905	" " "		123 40
	Omitted to be credited		38 00
1906	Charged Reid and Outlet By-law 741, in error	18 00	
	Charged in error—should be Reid and Outlet, By-law 741.		400 00
1907	Omitted to be charged	1 80	
		$58 30	$562 20
Silver Creek, South Part:			
1903	Omitted to be charged	$30 00	
Stevenson:			
1907	Charged in error—should be Lundy		$5 00
Wilkinson, Shilson:			
1906	Over credit	$12 70	
	Error stating balance	10	
		$12 80	
Sylvester, Wiper:			
1901	Error stating balance		$9 00
Wyatt:			
1905	Omitted to be charged	$3 00	
1906	Reversing a credit of $7.00 which should have been debited	14 00	
		$17 00	
No. 7, or Two Creeks:			
1899	Charged to close account in error		$6 00
1900	Error stating balance		10 80
	Charged to close account in error		25 00
			$41 80
No. 12, or Two Creeks:			
1904	Charged to close account in error		$11 25
No. 21, or Village:			
1899	Charged to close account in error		$42 37

TOWNSHIP OF MERSEA.

Analysis of School Levy Balance as at December 31st, 1908.

Due from 1908 Levy:			
S. S., No. 4		$700 00	
" " 12		950 00	
" " 16		40 91	
" S. W.		400 00	
Separate School Section		34 20	
Total 1908 Liability			$2,125 11
Add Surplus of Levies:			
Year 1899	$48 16		
" 1900	98 37		
" 1901	25 63		
" 1902	38 48		
" 1903	52 84		
" 1904	122 26		
" 1907	35 35		
Total surplus in Levies		$421 09	

Deduct Deficit of Levies:		
Year 1905	$3 54	
" 1906	57 92	
" 1908	188 42	
Total Deficit in Levies		$249 88
Add Net Surplus of Levies		171 21
Liability, December 31st, 1908		$2,296 32

TOWNSHIP OF MERSEA.

STATEMENT OF ARREARS OF TAXES AS AT DECEMBER 31ST, 1908.

N. Pt.	Lot	22	Con.	A	$5 26
W. ½ S. E. ¼	"	19	"	B	69 46
All	"	21	"	B	
and	"	19, 20 and 21	"	C	37 46
Pt. S. Pt.	"	7	"	1	1 17
Pt. S. E. Pt.	"	5	"	8	25 48
N. Pt.	"	5	(Lots 55 to 59 St. Clair)	" 11	3 70
Pt.	"	5	(Lot 51, St. Clair)	" 11	2 55
N. E. Pt.	"	5	(Lot 52, St. Clair)	" 11	35
Pt.	"	5	(Lot 37, Erie)	" 11	42
Pt. N. Pt.	"	5	(Lots 38 to 40, Erie)	" 11	4 49
Pt. N. Pt.	"	5	(Lot 24, Mill)	" 11	8 68
Pt.	"	6	(Lot 10, Town Line)	" 11	3 04
Pt. N. Pt.	"	6	(Lot 7, Town Line)	" 11	6 07
Pt. N. Pt.	"	6	(Lot 4, Town Line)	" 11	1 67
Pt. N. Pt.	"	6	(Lot 9, Town Line)	" 11	2 99
Pt.	"	6	(Lots 3, 5 and 6, Town Line, and Lots 27 and 29, Maracle)	" 11	1 71
Pt. N. Pt.	"	6	(Lot 17, Mill)	" 11	2 86
Pt.	"	218	(Lots 50 and 51, Eastman Survey)	" N.T.R.	4 79
Pt.	"	218	(Lots 27, 29, 30 and 31, Eastman Survey	" N.T.R.	2 96
Pt.	"	218	(Lot 42, Eastman Survey)	" N.T.R.	74
Pt.	"	218	(Lot 49, Julien)	" N.T.R.	1 13
Pt. Ctr. Pt.	"	218		" S.T.R.	8 84
Balance per Arrear Record					$195 79

Add Corrections:		
Pt. N. Pt. Lot 5 (Lot 38, Erie) Con. 11		$0 39
Returned 1901, but not accounted for by County Treasurer.		
Pt. Lot 22 " B		7 49
Returned for Roll 1902 as	$5 34	
Balance not accounted for by County Treasurer	2 15	
Not placed on Roll 1902.		
N. E. Pt. Lot 5 (Lot 47, Erie) " 11		85
Returned for Roll 1902, but not placed on Roll.		
N. W. Pt. Lot 4 " 1		6 00
Returned for Roll 1906 as	$16 91	
Placed on Roll 1906 as	10 91	
Included in Statement of Assets as		$210 52

TOWNSHIP OF MERSEA.

STATEMENT OF BALANCES, CURRENT RATE ACCOUNTS AS AT DECEMBER 31ST, 1908.

Special Drainage:		
By-law 697 Chase	Credit	$240 77
" 700 North Part Silver Creek Assessment, 1908, to meet 1908 Installment	"	18
" 704 No. 12 or Two Creeks	"	157 02
" 705 Goslin	"	261 12
" 725 Irwin	"	93 01
" 731 B and C Concession	"	143 24

"	735 Collison	"	230 32
"	738 11th Concession	"	276 40
"	739 Bailey	"	210 91
"	741 Reid and Outlet	"	998 02
"	743 Wilkinson, Shilson	"	886 51
"	744 Stevenson	"	240 76
"	748 Fox—Assessment, 1908, to meet 1908 Installment	"	01
"	755 1st Concession	"	462 96
"	756 Hillman	"	187 60
"	757 Big Creek	"	1,166 09
"	759 Coulson	"	721 43
			$6,276 35

Tile Drains:

No. 1	"	$7 36
" 2	"	7 36
" 3	"	7 36
" 4	"	7 36
" 5	"	7 36
" 6—Assessment, 1908, to meet 1908 Installment	"	nil
" 7	"	7 36
" 8, 9, 10	"	22 08
		$66 24

Wheatley Sidewalks:

By-law 674	Debit	$4 48
" 730	Credit	5 72

Schools:

S. S. No. 6	Credit	$202 55
*S. S. No. 10	"	261 64
U. S. S. " 12 (Romney)	"	181 77
S. S. No. 15	"	131 18
S. S. S. W.	"	349 90
		$1,127 04

*The amount at Credit S. S. No. 10, Rate Account, is balance of extra assessment made in 1908, and has since been refunded.

Pelee Marsh:

By-law 719	Credit	$2,619 70

TOWNSHIP OF MERSEA.

STATEMENT OF DRAINAGE BALANCES DECEMBER 31ST. 1908.

SHOWING INTEREST, DEBITS AND CREDITS.

Present By-law No.		Corrected original balance.		Interest for period.		Balance as at Dec. 31, '08.	
		Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
685	Atwell	91 86	.....	34 18	14 37	111 67	.....
562	Big Creek, 9th concession	15 50	.....	5 05	.....	20 55	.....
579	Big Creek, T. W	.....	152 68	.....	88 63	.....	241 31
757	Big Creek	80 00	.....	10 22	87 23	2 99	.....
697	Chase	.....	35 70	17	12 76	.....	48 29
735	Collison	13 40	.....	95	5 97	8 38	.....
759	Coulson	103 24	.....	23	44 19	59 28	.....
602	A and B concession	.....	50 55	.....	20 47	.....	71 02
781	B and C concession, west part	.....	247 40	13 69	.....	.....	233 71
*	1st concession	.....	18 63	*	.....	.....	18 63
755	1st concession	.....	345 20	9 25	16 05	.....	352 00
659	2nd concession	.....	10 00	30	10 11	.....	19 81
623	10th concession	.....	62 06	.....	23 24	.....	85 30
738	11th concession	4 00	.....	.....	13 16	.....	9 16
780	Dales Robb	.....	194 00	.....	77 94	.....	271 94
705	Goslin	24 00	.....	5 38	24 05	5 33	.....
756	Hillman	.....	44 52	.....	3 92	.....	48 44
601	Hooker	164 00	.....	45 02	12 97	196 05	.....
725	Irwin	20 50	.....	49	1 59	19 40	.....
556	Lebo Creek	40 99	.....	8 10	.....	49 09	.....
603	Lundy	.....	25 06	.....	14 81	.....	39 87
668	Ogle, 10th concession	.....	14 63	.....	9 00	.....	23 63
609	Ogle, 11th concession	.....	4 00	82	7 49	.....	10 67
678	Ogle, east part	.....	51 25	17 07	94 12	.....	128 30
628	Ogle, west part	240 92	.....	11 76	21 95	230 73	.....
684	Piggott Creek	.....	63 92	.....	46 15	.....	110 07
441	Reid, 10th concession	11 50	.....	7 56	82	18 24	.....
741	Reid and Outlet	554 47	.....	12 74	84 43	482 78	.....
739	Reid, 11th concession (Bailey)	.....	67	.....	17 35	.....	18 02
737	Ruscom, North Gosfield	.....	11 00	4 21	3 29	.....	10 08
677	Ruscom and Silver Creek, Rochester	.....	66 46	151 98	28 65	56 87	.....
700	Silver Creek, north part	126 96	.....	18 58	590 29	.....	444 75
664	Silver Creek, south part	.....	27 07	.....	36 78	.....	63 85
681	Sloan or Ruscom	.....	.....	24 65	35 71	.....	11 06
575	South Dales, north branch	.....	14 54	*	.....	.....	14 54
605	South Dales	80 24	.....	6 55	15 95	70 84	.....
794	South Dales, east branch	73 15	.....	27	.....	73 42	.....
744	Stevenson	.....	114 62	.....	66 34	.....	180 96
743	Wilkinson Shilson	.....	36 63	.....	18 93	.....	55 56
650	Sylvester Wiper	.....	42 47	.....	18 80	.....	61 27
788	Wyatt	.....	1,068 32	48 71	.....	.....	1,019 61
635	No. 7 or Two Creeks	.....	41 80	.....	18 60	.....	60 40
704	No. 12 or Two Creeks	.....	21 25	.....	4 30	.....	25 55
612	No. 21 or Village	18 63	.....	65	11 91	7 37	.....
		1,663 36	2,764 43	438 58	1,602 32	1,412 99	3,677 80
	Net balances	.....	1,101 07	.....	1,163 74	.....	2,264 81

*Old balance—no interest calculated.

TOWNSHIP OF MERSEA.

Statement of School Loan Debenture Debt, as at December 31st, 1908.

No. of By-Law.	——	Year of Issue.	No. Years.	Amount.	Interest Rate.	Years to run.	Principal Unpaid.
				$ c.			$ c.
697	Chase	1904	5	1,042 00	5%	1	229 10
700	North Part Silver Creek	1904	5	8,469 00	"	1	1,862 00
704	No. 12 or Two Creeks	1904	5	679 10	"	1	149 31
705	Goslin	1905	5	1,130 00	"	2	485 21
725	Irwin	1905	5	402 55	"	2	172 86
731	B. and C. Concession	1906	5	620 00	"	3	389 95
735	Collison	1906	5	996 00	"	3	626 43
738	11th Concession	1906	5	1,196 00	"	3	752 23
739	Bailey	1906	5	913 00	"	3	574 23
741	Reid and Outlet	1906	5	4,313 00	"	3	2,712 66
743	Wilkinson Shilson	1906	5	3,836 00	"	3	2,412 65
744	Stevenson	1906	5	1,042 00	"	3	655 37
748	Fox	1906	5	1,123 00	"	3	706 31
755	1st Concession	1907	5	2,004 00	"	4	1,641 27
756	Hillman	1907	5	812 00	"	4	665 02
757	Big Creek	1907	5	5,047 50	"	4	4,133 90
759	Coulson	1907	5	3,122 00	"	4	2,556 92
781	West Part B & C Concession	1908	5	1,159 50	"	5	1,159 50
788	Wyatt	1908	5	1,940 50	"	5	1,940 50
							$23,825 42

Statement of Local Improvement Debenture Debt as at December 31st, 1908.

No. of By-Law.	——	Year of Issue.	No. Years.	Amount.	Interest Rate.	No. Yrs. to run.	Principal Unpaid.
				$ c.			$ c.
1	Leonard Wigle	1893	20	100 00	4%	5	32 74
2	Ira Rymal	1893	20	100 00	"	5	32 74
3	H. W. Bull	1894	20	100 00	"	6	38 56
4	Leonard Wigle	1894	20	100 00	"	6	38 56
5	Wm. Sheldon	1895	20	100 00	"	7	44 15
6	John B. Scott	1896	20	100 00	"	8	49 53
7	Wm. Mitchell	1897	20	100 00	"	9	54 70
8, 9, 10	Sylvester J. McLenan	1898	20	300 00	"	10	179 01
							469 99

Statement of Pelee Marsh Debenture Debt as at December 31st, 1908.

No. By-Law.	——	Year of issue.	No. years.	Amount.	Interest Rate.	No. yrs. to run.	Principal unpaid.
				$ c.	%		$ c.
640	U. S. No. 15	1900	10	1,000 00	5		240 75
*	U. S. S. No. 12, Romney	1902	20	2,500 00	4	14	1,943 12
742	S. S. No. 6	1906	3	550 00	5	1	192 34
758	S. S. S. W	1907	10	2,700 00	5	9	2,485 32
							4,861 53

*There is no By-Law of Mersea for this. The debentures were issued by the Township of Romney under their By-Law No. 709, and this is the Township of Mersea's share. The annual payment due the Township of Romney is $183.95, which includes principal and interest.

STATEMENT OF DRAINAGE DEBENTURE DEBT AS AT DECEMBER 31ST, 1908.

No. By-Law.	——	Year of issue.	No. years.	Amount.	Interest rate.	No. yrs. to run.	Principal unpaid.
					%		$ c.
674	Wheatley Sidewalks	1902	20	2,469 00	4½	14	1,940 36
730	do	1905	20	1,773 10	4½	17	1,595 80
							3,536 16

STATEMENT OF TILE DRAIN DEBENTURE DEBT AS AT DECEMBER 31ST, 1908.

No. By-Law.	——	Year of issue.,	No. years.	Amount.	Interest rate.	No. yrs. to run.	Principal unpaid.
				$ c.	%		$ c.
523	Second Issue	1898	16	2,908 00	5	6	1,361 45
719	First Issue.....	1905	30	20,000 00	5	27	19,051 00
719	Second Issue	1905	30	1 ,500 00	5	27	10,954 33
719	Third Issue	1905	30	11,000 00	5	27	10,478 05
							41,844 83

TOWNSHIP OF MERSEA.

STATEMENT OF ASSETS AND LIABILITIES, DECEMBER 31ST, 1908.

Assets.

Active:		
Cash	$1,844 44	
Uncollected Taxes of 1908	29,188 32	
Arrears of Taxes (per Schedule)	210 52	
Special Drainage,—Contra $3,677.80,—(per Schedule)	1,412 99	
Award Drains (per Schedule)	104 00	
Pelee Marsh	807 19	
		$33,567 46
Fixed:		
Land, Buildings and Furniture, Road Machinery, etc. (Estimate)	$3,000 00	$3,000 00
Passive:		
Special Drainage	$23,825 42	
Pelee Marsh System	41,844 83	
Tile Drainage	469 99	
Schools	4,861 53	
Wheatley Sidewalks	3,536 16	
		$74,537 93
Other Assets:		
Per Schedule (Without Interest)		343 36
		$111,448 75

Liabilities.

Bonded:		
Special Drainage Debenture Debt (per Schedule)	$23,825 42	
Pelee Marsh Debenture Debt (per Schedule)	41,844 83	
Tile Drainage Debenture Debt (per Schedule)	469 99	
School Loan Debenture Debt (per Schedule)	4,861 53	
Wheatley Sidewalks Debenture Debt (per Schedule).....	3,536 16	
		$74,537 93

Floating:		
Advances	$5,000 00	
Special Drainage,—Contra $1,412.99,—(per Schedule)	3,677 80	
Tile Drainage	100 00	
County Rate	5,820 15	
School Levies (per Schedule)	2,296 32	
Legislature and County Grant	18 65	
Rate Accounts (per Schedule)	10,090 57	
		$27,003 49
Other Liabilities:		
Per Schedule (Without Interest)		$177 00
Surplus:		
Assets over Liabilities		$9,730 33
		$111,448 75
And a Contingent Liability to the Township of Tilbury West, as per F. H. Macpherson Audit, 1904, as follows:		
Half cost survey, plans, etc., Lowden Drain		$44 50
Interest to July 15th, 1904		17 35
		$61 85
And additional Interest to date		

TOWNSHIP OF MERSEA.

Other Assets.

Collector Taxes, 1903:	
Error in addition of Roll in that year	$1 00
Collector Taxes, 1906:	
Difference between balance uncollected and amount returned that year	1 00
W. G. Morse:	
Short taken to Debit, August 1st, 1902, re 2nd Concession Drain. Add Interest from August 1st, 1902, to date of settlement	100 00
Alfred Hairsine:	
Short placed on Roll of 1905 re Mills Award. Add Interest from December 31st, 1905, to date of settlement	4 50
County of Essex:	
Proportion of amount paid in 1909 re Tile Drain Assessment House of Refuge property, applicable to Rate Account at December 31st, 1908.	7 36
Township of Gosfield North:	
Assessment unpaid under By-law 681, Sloan or Ruscom Drain, passed in 1903. Add Interest from date four months after service of notice to date of settlement, and credit drain account with full amount	45 00
Township of Tilbury West:	
Assessment unpaid under By-law 738, 11th Concession Drain, passed in 1906. Add Interest from date four months after service of notice to date of settlement, and credit drain account with full amount	25 00
Township of Tilbury West:	
Assessment unpaid under By-law 741, Reid Drain, passed in 1906. Add Interest from date four months after service of notice to date of settlement, and credit drain account with full amount	50 00
Township of Tilbury West:	
Assessment unpaid under By-law 788, Wyatt Drain, passed in 1908. Add Interest from date four months after service of notice to date of settlement, and credit drain account with full amount	109 50
Carried to Statement of Assets	$343 36

Other Liabilities.

Township of Tilbury West:
Assessment unpaid under By-law 780, Dales Robb Drain (for Bridge), passed in 1908. Add Interest from date four months after service of notice to date of settlement, and charge drain account with full amount $162 00

Alfred Hairsine:
Amount due him for Clerk's fees under By-law 635, No. 7, or Two Creeks Drain, and charge drain 15 00

Carried to Statement of Liabilities $177 00

TOWNSHIP OF MERSEA.

FORM OF JOURNAL ENTRY COVERING COLLECTOR'S ROLL.

Collector Taxes ..... Debit			$40,452 23	
Rate Accounts ..... Credit				$13,539 24
Dales Robb	By-law	693	$483 74	
Chase	"	697	240 73	
Silver Creek	"	700	1,956 41	
No. 12 or Two Creeks	"	704	156 90	
Goslin	"	705	261 09	
Pelee Marsh	"	719	2,930 76	
Irwin	"	725	93 00	
B and C Concession	"	731	143 23	
Collison	"	735	230 16	
11th Concession	"	738	276 32	
Bailey	"	739	210 91	
Reid	"	741	997 39	
Wilkinson Shilson	"	743	886 25	
Stevenson	"	744	240 72	
Fox	"	748	259 42	
1st Concession	"	755	462 95	
Hillman	"	756	187 59	
Big Creek	"	757	1,166 04	
Coulson	"	759	721 33	
Wheatley Sidewalks	"	674	189 95	
"	"	730	140 38	
S. S. No. 6	"	742	202 02	
S. S. No. 10	"	682	367 36	
S. S. No. 12	"	709	183 44	
S. S. No. 15	"	640	129 62	
S. S. S. W.	"	758	349 77	
Tile Drains, No. 1 to 10			71 76	
Special Levies ..... Credit				$2,167 91
Ogle	By-law	785	$241 50	
Sloan or Ruscom	"	785	469 90	
Dales Robb	"	780	189 00	
Pelee Marsh (Pumping)	"	523	1,267 51	
Award Drains ..... Credit				231 25
Delaurier			167 50	
Greig			32 00	
Baker			14 50	
Hope			17 25	
School Levies ..... Credit				10,565 27
(Credit each School Section with amount raised by General or Special Rate. The Debenture Levies show in the Rate Account.)				
Arrears of Taxes				158 09
County Rate				5,478 20
General Fund				8,312 27
			$40,452 23	$40,452 23

Various Statements not of general interest have been eliminated from the foregoing reports.

Toronto, 31st December, 1910.

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TWENTY-FIFTH ANNUAL REPORT

OF THE

COMMISSIONERS

FOR THE

Queen Victoria Niagara Falls Park

1910

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
Printed by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1911.

Printed by
WILLIAM BRIGGS,
29-37 Richmond Street West,
TORONTO.

COMMISSIONERS FOR THE QUEEN VICTORIA NIAGARA FALLS PARK.

JOHN W. LANGMUIR, Chairman.

GEORGE H. WILKES.

P. W. ELLIS.

COLONEL L. CLARKE RAYMOND, K.C.

WILLIAM L. DORAN.

LIONEL H. CLARKE.

JAMES D. CHAPLIN.

JOHN H. JACKSON, C.E.,
Superintendent.

J. HARRISON PEW,
Assistant Superintendent.

HENRY J. MOORE,
Chief Gardener.

PARLIAMENT BUILDINGS,
TORONTO, 1911.

To the Honourable JOHN MORISON GIBSON, K.C., LL.D., *Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I beg to submit to you herewith the Twenty-fifth Annual Report of the Queen Victoria Niagara Falls Park Commission, 1910.

I have the honour to be,

Your Honour's most obedient servant,

W. J. HANNA,

Provincial Secretary.

To the Honourable W. J. HANNA, K.C., M.P.P., *Provincial Secretary, Province of Ontario, Parliament Buildings, Toronto.*

SIR,—I have the honour to transmit herewith for presentation to the Legislature of Ontario the Twenty-fifth Annual Report of the Commissioners for the Queen Victoria Niagara Falls Park (being for the year 1910), together with statements of receipts and expenditures and other documents connected with the Report.

I have the honour to be, Sir,

Your obedient servant,

J. W. LANGMUIR,

Chairman.

TORONTO, February 24th, 1911.

TWENTY-FIFTH ANNUAL REPORT

OF THE

Commissioners of the Queen Victoria Niagara Falls Park.

To the Honourable JOHN MORISON GIBSON, K.C., LL.D., *Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

The Twenty-fifth Annual Report of the Commissioners for the Queen Victoria Niagara Falls Park (being for the year 1910) is herewith submitted, together with the usual statement of Receipts and Expenditures, including payments for the construction of the Niagara River Esplanade. The work of the year is fully detailed in the report of the Park Superintendent, which will be found in the Appendix, together with the text of contracts, agreements and other official documents.

The Board of Commissioners, comprising six members at the date of the last Annual Report, was increased to seven by the appointment of Mr. James D. Chaplin, of St. Catharines, under Order-in-Council dated September 9th, 1910.

ONTARIO POWER COMPANY'S SPILLWAYS.

At the opening of the year the Commissioners were called upon to consider and determine the location and design for the spillway buildings required for the two remaining pipes or conduits of the Ontario Power Company, one of which is now under construction and the other not yet commenced. Under the Pipe Line and Power House Agreement, dated 28th February, 1903, it is provided among other things that "the location of the overflow or regulating device for pipe No. 1 on the map attached is approved by the Commissioners, but the design and method of constructing the same and the location and design of the overflows Nos. 2 and 3 shall be submitted for the approval of the Commissioners and shall not be proceeded with until such approval is obtained."

In furtherance of this Agreement, the Power Company submitted plans showing structures placed immediately in front of the Administration Building, which, if approved of and had the buildings been proceeded with, would not only have obstructed to a most objectionable extent the magnificent view of the Falls and the lower Gorge from the spacious verandahs on both floors of the Administration Building, but would also seriously encroach on the beautiful pleasure grounds in front of the Administration Building, which, from the physical formation of the Park at that crucial point, are already too congested. The situation was further complicated by the statement of the Company's Engineers claiming that certain technical advantages would be gained by having the spillways and the regulating devices connected therewith at or near the terminus of each conduit.

The controversy on the various points was conducted in the most friendly spirit with a desire on the part of the Park Commissioners to accede to the rea-

sonable requests of the Power Company. The Commissioners, however, from their experience in the construction of Spillway No. 1, and notwithstanding that the Company offered to spend money freely on architectural adornment and masking of the structures, decided, for the reasons given, that the plan submitted should not receive the approval of the Board.

Failing the approval of the Commissioners of this initial plan, the Company then proposed to build both of the regulating devices for the second and third conduits conjointly on the site of the Administration Offices, but extending easterly much nearer to the face of the cliff. Many joint conferences were held to fully ascertain the requirements of the hydraulic plant in their relation to the very restricted area of ground in front of the Administration Building. In addition to the careful study of the subject by the Commissioners and their Superintendent, it was deemed important to secure expert advice to aid in the solution of the problem. From the advice thus obtained it was evident that although the joint building plan had much merit the serious question of encroachment on the very limited space fronting the cliff entirely precluded acceptance by the Commissioners. While objecting somewhat to the position taken by the Commissioners, the Company again reviewed the matter and submitted a third proposal for a location immediately north and westerly from Spillway No. 1, which met with the prompt approval of the Commissioners. Whereupon an agreement was entered into providing for the location and design for the spillway for Conduit No. 2 as well as a location when required for the third building to be attached to Conduit No. 3. The position selected for this last structure is to be immediately adjoining No. 2 building or with the option to the Commissioners of placing it to the north side of the Administration Building and to the rear of its front face extended northerly. This agreement defining the location of all the spillways provided for in the various agreements with the Power Company was approved by Order-in-Council. (See Appendix "C.") The importance attached to the exercise of the power of approval by the Commissioners is shown from the fact that the joint conferences in connection with the matter extended from January to November.

Shipyard Property.

In December, 1903, an agreement was entered into between the Commissioners, representing the Government of Ontario, and the Canadian Shipbuilding Company for the establishment of a modern plant for building and repairing vessels on a large scale. The Company purchased land and erected shops, dredged slips, and commenced operations requiring the investment of a very large sum of money, but in spite of every effort it was found impossible to compete with established yards under present conditions, and the Company was compelled to go into liquidation with little or no prospect of being revived. Inasmuch as the site of the works, situate on the bank of the Niagara River, about three miles north of Bridgeburg Village, occupied a part of the original Chain Reserve, necessitating the deviation of that part of the River roadway, it was of vital importance to the Esplanade scheme to ascertain what disposition should be made of the Shipyard property. It was with considerable satisfaction, therefore, that negotiations were opened by the interests heavily affected for reviving the project as a structural iron and steel industry. Advantage was taken of the situation to materially improve the alignment of the Esplanade roadway, which, instead of leaving the Niagara River at nearly a right angle, will now leave it by gently curving lines at both northerly and southerly extremities. As the first Company was under obligation to construct a

roadway around the works to replace the Chain Reserve, which it had only turnpiked, the sum of Ninety-six hundred dollars ($9,600) has been paid by the Company to the Commissioners to defray the cost of a first-class macadam road similar to the Esplanade roadway. This will be built in the Spring of 1911.

Cantilever Bridge.

At the time the Chain Reserve along the front of the present City of Niagara Falls was vested in the Commissioners, the Niagara Peninsula Bridge Company (the Michigan Central Cantilever Bridge) was occupying a portion of the Chain Reserve between Park and Bridge Streets under a License of Occupation from the Dominion Government. After the Chain Reserve became vested in the Commissioners the Bridge Company applied to them for a confirmatory title, but the negotiation was not completed beyond the Bridge Company paying the amount agreed upon by the parties to the Dominion Government. This year when the Bridge Company applied for approval of certain changes at the Canadian approach to the Cantilever Bridge it was considered opportune to complete the transaction, and the Deed was approved and delivered when the Dominion Government paid One thousand dollars and interest, amounting altogether to Thirteen hundred and fifty-two dollars and thirty-seven cents, which is shown in the receipts for the year.

International Railway Fares.

The question of fares on the Park and River Division of the International Railway has been before the Commissioners since 1906, and in 1908 a Conference was held between representatives of the Board of Trade from Niagara Falls and Chippawa (the applicants for a reduced scale of charges) and the Officials of the International Railway to enquire into the merits of the request. The Company protested its inability to reduce the minimum charge of ten cents on the plea of insufficient earnings to pay more than a merely nominal interest upon the investment. The Commissioners, however, were relieved from making an order on the advice of Sir Æmilius Irving, K.C., the Park Solicitor, to the effect that the remedy, if any, lay in an application to the Ontario Railway and Municipal Board. This application was made by the Niagara Falls Board of Trade and argued in Toronto, with the result that the Railway Board decided that it had jurisdiction and ordered a 5-cent cash fare between Bridge Street and a point three miles south thereof. The Court of Appeal, however, reversed this decision, and jurisdiction was placed in the Board of Park Commissioners as originally provided in the Act of Incorporation of the Railway Company. A hearing before the Park Board was arranged for November 25th, and both parties presented evidence respecting the matter in dispute with the exception of statements of earning power of the Railway Company. These statements have now been furnished, and the Board of Trade has been called upon to file their answer to the same, when it is to be hoped a decision will shortly be reached in this long-standing controversy.

Excess Rental.

The litigation referred to in the last Annual Report is still in progress. An appeal, on behalf of the Attorney-General and the Commissioners, from a judgment of the Trial Judge (Mr. Justice Riddell), is now before the Court of Appeal for argument, and is to be proceeded with, unless a compromise, which can be approved as satisfactory, is arrived at, as the result of certain negotiations now being carried on.

Queen Victoria Park.

With the approach of the winter of 1909 a systematic effort was commenced to prune the specimen trees throughout the Park proper and the modern method of preservation by the application of an impervious surface to wounded parts was established. Many valuable trees have thus been saved from early decay and disease prevented from gaining access to the trunks of the trees.

Special attention has been devoted in obtaining a display of flowers for the gratification of the many visitors who come to the Park in the early Spring, and a greatly increased area has been given to the establishment of a collection of aquatic plants at Island Pond and the new fountain near this point. The results have already been very encouraging, and increased success is looked for next year. The extensive collection of plants and shrubs exhibited by the Park at the Horticultural Exhibition, St. Catharines, showed a marked improvement in this important feature of Park embellishment.

It is satisfactory to record that a beginning has been made to reclaim for Park purposes the area between the Canadian Niagara Power House and the Electrical Development Power House. This space, which has heretofore been used by these Power Companies for storage of construction material, comprising an area of about 1,000 feet in length by 200 feet in width, has been re-surfaced to grade and planted with specially selected specimens of young nursery-grown stock. A system of neat labelling has been adopted for the trees and shrubs through the Park, so that visitors may know the plant life both by its common and botanical name. This system has been methodically extended to the herbaceous garden, which has been completely re-designed and planted according to classified order.

Early in the year the Superintendent recommended the laying of several experimental sections of roadway for the purpose of obtaining a practical test of the various methods and the adoption of the best in connection with the large mileage of road maintenance which must be assumed with the completion of the Upper River Boulevard. The Board approved of this suggestion, and a number of different methods of treatment were placed under a practical test, and the results tabulated. It is believed that the information gathered for the coming work will amply prove the wisdom of this preparatory work and justify the expenditure made in that connection.

In 1904 a stone and iron panel parapet wall was constructed along the Cliff from the Horseshoe Falls northerly to the Administration Building, with the intention of continuing it to the northerly limit of the Park proper. With so many works of greater necessity in progress, as well as the partial occupation of the ground by the Ontario Power Company's operations, the further extension of the work was postponed. This year, however, it was decided to build the length between Inspiration Point and Rambler's Rest, and the foundation is now finished and the section will be completed in the early Spring.

It has always been the aim of the Commissioners to provide for the full enjoyment of the whole Park area by the people of Canada and visitors from the other countries. It is therefore with more than ordinary disappointment that the Board has again to face the temporary disturbance of the Park surface in the vicinity of the Administration Building by the necessary development of the power resources of the Cataract. This season the disturbed surface will come to the very doors of the Administration Building with no abatement of the unsightly construction plant and machinery until the spillway of the second conduit is completed.



Laura Secord Monument.

Queenston Heights.

This charming part of the Park system continues to gain in popularity as the seasons pass, and the number of visitors who stop over for an hour in making the Belt Line trip, as well as excursionists who come to spend the day on the Heights, is constantly increasing. The prominent vantage point at Brock's Monument is being further utilized in the construction of a promenade that will make it possible to view the face of the escarpment both east and west.

The Dominion Government made a liberal grant for the erection of a monument to perpetuate the memory of that heroine of Niagara Frontier History, Laura Secord, and the Commissioners were entrusted with the selection of the site and the execution of the work. The Monument was completed late in the year, and it is proposed that suitable unveiling ceremonies will take place in the early summer of 1911, when Sir George Ross, through whose instrumentality the grant was secured, will officiate.

Other improvements at this historic point include the laying out of a recreation area with new paths, also the training of young trees planted in recent years, the shape and beauty of which were both destroyed by the prevailing high winds, and much labor was necessary to straighten the trunks. The restaurant had again to be enlarged, the Lessee paying an increased rental of ten per cent. upon the cost, and the caretaker's dwelling was repaired and a verandah added.

During the year the Dominion Government granted to the Commissioners the roadway through the Park, which is part of the Military Reserve, in order that control might be obtained and regulations made to prevent vendors of souvenirs from operating to the annoyance of visitors.

Niagara Glen.

This outlying Park, with its rugged area extending from the line of the cliff to the turbulent waters of the rapids beneath, continues to be much appreciated for its picturesque natural scenery and peaceful quietness. The Commissioners have under consideration the development of the upper level plateau from the Electric Railway tracks to the cliff edge in keeping with the natural features of the lower Park, and a beginning was undertaken last summer when the whole of the length skirting the edge of the cliff from the Park proper to Queenston was cleared of long grass, weeds and brush.

Butler's Burying Ground.

Previous reports show that a beginning was made to place and keep in proper condition the sacred and historic spot known as Butler's Burying Ground, and during the last two years a considerable outlay has been made in restoration. Owing to its extreme isolation, it now becomes necessary to provide a proper roadway and entrance to the property.

Lundy's Lane.

Upon a Statute of the Province passed last year Drummonhill Cemetery, the site of Lundy's Lane Battlefield, was added to the outlying Park territory, and during the year a considerable sum was expended in levelling and grading the surface, the construction of paths, and general restoration work. During the pro-

gress of the work the bodies of nine United States soldiers were unearthed at a point near the Laura Secord bust, which were re-interred with imposing ceremonies under the auspices of the Lundy's Lane Historical Society, in conjunction with representatives from the local societies across the border and representatives from the United States army.

Fort Erie.

The usual maintenance work has been performed at the old Fort grounds, and a suitable closed shelter and implement house for the Caretaker will be built this next year. Last Spring the Municipality of Fort Erie undertook the construction of a Municipality-owned waterworks system, and applied to the Government for a water lot to be used as the site for the Pump House and Intake. This was authorized by the Commissioners.

Park Restoration.

During the entire year the Ontario Power Company has been occupied with the construction of the second eighteen-foot diameter reinforced concrete conduit for carrying an additional supply of water from their head works above Dufferin Islands through the length of the Park proper to the Power House near the Administration Building. This work caused great disturbance of the Park surface at the southerly end of the Park.

Although good progress was maintained from the close of winter to the completion of the pipe a large area of surface restoration remains to be finished before any planting can be undertaken, and even then only temporary restoration can be done over a considerable portion, owing to the rights of the Company to construct a third conduit when the demand for power exceeds the capacity of the existing plant. The Power House below the Cliff has been enlarged to accommodate ten units, and the penstock connections from the supply pipe are being extended for the additional machines. With the opening of the Spring the filling over the top of the underground works will be carried to completion and the levelling up as required under the various agreements will be finished. The territory at the Head Works and as far as the Dufferin Islands outlet will be terraced, and when completed will present a very pleasing lawn surface planted with ornamental shrubs.

Niagara River Boulevard.

For over two years the Commissioners have been endeavouring by private negotiations to obtain from the owners along the River the necessary land required for roadway construction along the Upper Niagara River, and although very liberal offers were made for the strips of land required to provide a boulevard one hundred feet wide, the year opened with about fifty parcels unpurchased. The Commissioners were therefore reluctantly compelled to resort to expropriation proceedings. This procedure, while lengthy and requiring the observance of many technical details, placed the Commissioners in possession of the lands selected, leaving only the matter of compensation to be determined.

By the end of April sufficient progress had been made to advertise for tenders for practically all of the macadam construction from Chippawa to Bridgeburg, with the exception of three small portions. The work was let to the lowest tenderers, and has been prosecuted with some degree of vigor throughout the year, but not with the speed and despatch that was expected. In two instances the hostility of

property-owners in allowing their lands to be taken possession of until an order of the Court was procured, caused considerable delay, but even after making allowance for these obstructive proceedings, the progress of the work has not kept pace with the time schedule to ensure completion by the time specified. The strongest possible measures are now being taken under the several contracts to hasten the progress of the work, so that it may be completed during the year 1911.

During the last Fall plans were prepared for the small connecting lengths at "Cozy Dell," and also through the Village of Chippawa, and tenders asked for the construction of the work, thus completing the Boulevard Roadway except the deviation of one mile at the Shipyard. Contracts were let to the lowest tenderers, and the work will be commenced with the opening of the Spring. To give effect to the Commissioners' plans for the route throughout the Village of Chippawa it became necessary to come to terms with the Village authorities respecting the use of streets running from the Niagara River on both sides of the Welland River to the bridge at Bridgewater Street, and the Municipal Council has passed a By-law confirming the arrangement arrived at. While the length of travelled roadway at this point is in excess of the route originally intended, by crossing the Welland River near its mouth by a bridge, under the plan adopted, the cost will be lessened and a pleasant stretch of river scenery will be obtained. The only section not under contract is that at the Shipyard, where special consideration is being given to the arrangement of roadway and planting, owing to its distance back from the river and its lessened width (80 feet). This is ready now for placing under contract.

Six bridges will require to be constructed along the route of the Boulevard, namely, at Frenchman's Creek, Usher's Creek, Boyer's Creek, Black Creek, Baker's Creek, and Miller's Creek. The arch type of bridge will be used with spans varying from 30 feet to 75 feet, finished architecturally to correspond with each location. The bridge over Frenchman's Creek is already completed, and the plans and specifications for the remaining five are ready for tenders, and, when accepted, the work will be completed with as much despatch as possible. From this *resumé* of operations it will be seen that the whole Boulevard roadway and bridge work is practically under contract, and every effort will be made to have it ready for traffic by the Fall of the coming year.

The planting of the space on either side of the road is a matter that will require the careful attention of the Commissioners, and which, obviously, cannot be hastened to the same extent as the road construction. Even when the requisite variety of tree and shrub specimens are planted, nature and great care alone can bring to perfection the design contemplated. Advantage will be taken to bring into the proper degree of prominence each projecting point along the River, and the mouths of some of the creeks will lend themselves to ornate treatment of a special character. A large amount of grading and levelling has already been completed on sections of the roadway now finished, so that tree planting may proceed at an early date, and by the end of the year some idea of the general design of the Boulevard plan as a whole will be in evidence.

The project of boulevarding this frontier as an outlying park has not so far added materially to the maintenance charges of the Park system, but a considerable appropriation for repair and improvement work will require to be made each year in order to keep the appearance of the Boulevard up to the highest standard of modern requirements.

The regulation for the use of the road and lawns by the public will require to be enforced by police patrol in conjunction with the men who will be responsible

for the repair of wear and tear upon the macadam surface. The expenditures for this supervision and up-keep will have to be partially provided for during 1911.

Financial Statements.

An examination of the financial statements as exhibited in the Receipts and Expenditures Accounts herewith attached shows that the gross receipts for the twelve months amounted to $148,539.50. Included in this amount, however, is the sum of $2,000 received from the Dominion Government for the construction of the Laura Secord Monument, which amount was disbursed as soon as the Monument was completed. Deducting this sum, the receipts for the year were $146,539.50.

These statements further show that in addition to the fixed rentals received from the three Power Companies, amounting to $60,000, there was also received $62,847.18 for excess rents for power generated, used, sold or disposed of under the terms of the agreements, making the total rents received from Power Companies for the year $122,847.18, as compared with $91,720.57 in the preceding year. The excess rentals were received from the three Power Companies without prejudice to the suit which is now pending.

The revenues received from other sources, namely: The International Railway Company's rent, Zybach & Company's franchise, Brock Monument tolls, wharf privileges, and other rentals amount to $22,339.95. The Zybach & Company franchise expires in 1913, when the question of the Park Commission taking over and operating the privileges included in the franchise will be carefully considered. It is thought that such operation would largely increase the revenue derived from these sources.

The capital expenditures on works in the Park Proper and outlying Parks amounted to $43,380.71, the details of which will be found in the statements attached. The expenditures for ordinary maintenance and up-keep of the Park system in all its branches is also given in detail in the accounts, and amount to $42,636.99. The coupon interest paid on the bond issue for the year was $27,639.37.

Niagara River Boulevard Expenditures.

These expenditures for acquirement of land, road construction, etc., are given in detail in the statement hereto attached, and amount to $60,613.73, which, with the payment of the overdraft in the Imperial Bank in the preceding year for similar expenditures, together with interest thereon, brought the expenditures on Boulevard Account up to $88,346.26.

Of the $200,000 debentures authorized by the last Legislature $30,000 were sold and the proceeds credited to the account, leaving an overdraft in the Imperial Bank at the close of the year for Boulevard Expenditures of $58,105.99. This overdraft has, however, since the closing of the accounts for the year, been covered by the sale of a further $70,000 of Debentures, leaving $100,000 bonds still unsold.

All which is respectfully submitted,

J. W. Langmuir,
Chairman.
P. W. Ellis.
George H. Wilkes.
L. Clarke Raymond.
William W. Doran.
L. H. Clarke.
J. D. Chaplin.



Transplanting Full-grown Trees.



Transplanting Full-grown Trees.

QUEEN VICTORIA NIAGARA FALLS PARK.
FINANCIAL REPORT, 1910.

RECEIPTS.

Balance on hand December 31st, 1909		$ 23,780 68
Ontario Power Company, rental	$30,000 00	
Ontario Power Company, excess rental	20,611 00	
Canadian Niagara Power Co., rental	15,000 00	
Canadian Niagara Power Co., excess rental	25,857 48	
Electrical Development Co., rental	15,000 00	
Electrical Development Co., excess rental (1908-1909-1910)	16,378 70	
International Railway Company, rental	10,000 00	
Zybach & Company, rental	9,000 00	
Brock's Monument tolls	1,608 35	
Wharf privileges	501 00	
Sundry rentals	1,230 60	
Cantilever Bridge Company, for land	1,352 37	
Laura Secord Memorial Grant, from Dominion Government	2,000 00	
		148,539 50
		$172,320 18

EXPENDITURES.

CAPITAL ACCOUNT:

Queen Victoria Park—			
New roads and paths		$6,048 67	
Water supply		3,155 60	
Trees, shrubs and planting		666 73	
Equipment: Park	$5,441 30		
Office	265 03		
		5,706 33	
Garage, Green Houses and Bath Houses		1,578 86	
Experimental road work		6,010 87	
Grading paths and roads, Dufferin Island Section		2,702 45	
Tool sheds, etc.		485 56	
Stone parapet wall		571 69	
Bridge Street Improvement		61 65	$26,988 41
Queenston—			
Promenade		926 85	
General improvements		714 56	
Restaurant alterations		515 40	
Laura Secord Monument		2,000 00	
Jennings lands		2,068 46	$6,225 27
Niagara Glen and Whirlpool—			
General improvement			$46 38
Lundy's Lane Cemetery—			
General improvement			$1,256 64
Fort Erie—			
General improvement			$15 30
Butler's Burying Ground—			
Land and improvement			$154 04
Legal and Special			2,990 00
Boulevard planting and drainage			4,204 67
Legal, Power Company suits			1,500 00
			$43,380 71

MAINTENANCE ACCOUNT:

Salaries—			
Office and clerical for Park System		$7,239 40	
Constables, Queen Victoria Park	$7,136 96		
Constables, Queenston	720 00		
Constables, Niagara Glen	638 75		
Constables, Fort Erie	414 48		
		8,910 19	

Wages—		
Queen Victoria Park	$13,124 22	
Queenston	1,587 29	
Niagara Glen	484 73	
Boulevard	392 10	
Lundy's Lane	61 30	
Materials—		
Queen Victoria Park	5,750 38	
Queenston	223 77	
Niagara Glen	21 32	
Fort Erie	17 00	
Lundy's Lane	65 08	
Niagara River Boulevard	135 58	
Travelling Expenses—office	1,013 68	
Sundry supplies, telegrams, postage, etc.	927 02	
Commissioners Expenses	891 28	
Miscellaneous	1,792 65	$42,636 99
Interest on bonds, including bank charges		27,639 37
Amount transferred to increase current account balance to $1,000 00 (June, 1909)		267 87
Balance in Imperial Bank December 31, 1910		58,395 24
		$172,320 18

NIAGARA RIVER BOULEVARD, 1910.

Section No. 1A	$11,692 11	
Section No. 2A	8,734 21	
Section No. 3B	6,548 79	
Section No. 4	9,340 86	
General Construction charges	7,684 55	
Lands	16,350 61	
Stone Protection	262 60	
		$60,613 73
Monthly interest on overdraft		244 85
Overdraft December 31st, 1909		27,487 68
		$88,346 26
Proceeds from sale of $30,000 Debentures		30,240 27
Overdraft in Imperial Bank		$58,105 99

SPECIAL ACCOUNT, 1903-1910.

For maintaining water levels at Intake of Canadian Niagara Power Company and the International Railway Company:

1903. January 31st. Deposited		$25,000 00
1905. December 30th. Interest to date		2,288 41
		$27,288 41
Less cost of submerged dam		2,189 32
		$25,099 09
1910. November 1st. Interest to date		3,884 72
		$28,983 81

SPECIAL SAVINGS ACCOUNT, 1910.

1910. August 8th. Canadian Shipbuilding Company for construction of Section No. 4 B, Niagara River Boulevard		$9,600 00
Interest to date		58 25
		$9,658 25

APPENDIX "A."

Report of the Park Superintendent.

To the Commissioners of the Queen Victoria Niagara Falls Park.

Gentlemen,—I submit herewith my report for the year ending December 31, 1910, comprising a detailed review of works accomplished in the Queen Victoria Park and the outlying parks of the system as authorized by the Board.

Owing to the many duties assigned to the guardianship of the Park Commissioners apart altogether from the usual routine over which a Park Board is asked to exercise control, and bestow careful attention, a considerable total of available time has of necessity to be given over to the consideration of such matters as power development, measurement of power for rental purposes, hearing of complaints respecting rates upon the Electric Railway operating through the Park system, and many other affairs of commercial significance foreign alike to the development of areas for public pleasure resort, retreats for lovers of nature, and open spaces full of fresh air. More than ever has this been true of the year just closed when considered along with the programme of development work mapped out for carrying to completion along the upper Niagara River in the construction of a driveway and boulevard. With the opening of 1910 came the problem of locating the spillway buildings for the second and third conduits of the Ontario Power Company's development, and it was not finally disposed of until the month of November, requiring much time and thought in the interval. One of the many solutions of the question presented called for the site of the Refectory and Administration Building with the consequent rearrangement for all the service furnished under its roof. Plans were examined and criticised for erecting a restaurant building in conjunction with the spillway and as an integral part of it, while designs for separate Administrative Offices at another location in the park were studied. With the decision to place the spillway structures adjoining No. 1 overflow and leave the Refectory intact, of course, the time spent became very largely unproductive effort that would have served another purpose to good advantage. When the undeveloped areas and stretches of the Park system are viewed and the opportunities for bettering and improving the beginnings that have been made are observed, it is small wonder that one feels impatient at losing time.

However, much has been accomplished both in the Park proper and the outlying portions of the whole system to encourage the staff to greater efforts and stimulate a wholesome spirit of emulation. Both the executive and working forces are better organized and the work is more evenly divided between the departments to secure an efficient management of maintenance and improvement plans.

The Horticultural Department under a new and trained head is fully alive to the necessity for maintaining a high standard of excellence in the planting and in producing of material for exhibition purposes, and already a marked improvement has shown itself in the class and quality of the plant life throughout the Park. Not only are the general results noticeably superior to those of former years, but the technical position is now on a sound basis for continued advance at a fair rate of speed. And within the limitation of the plant at our disposal constant progress will be in evidence. More material than ever before is being propagated under the Park's own glass, and this would be largely increased were the facilities at all adequate for even the most ordinary necessities of the greatly re-

duced area of Queen Victoria Park that can be made beautiful while the excavations and embankments from unfinished power developments are spread so largely over its southern limits. It is indeed an ironical situation which has prevented the outlay of money on greenhouse plant in former years, from lack of sufficient money, and at the present time still prevents the work proceeding, because of the urgent necessity of the development which supplies revenue in excess of the requirements.

The construction department has been fully employed upon the designing of the upper River roadway with its many details of grades, drainage and special features, but in addition sufficient time has been taken for properly planning the permanent improvement work authorized throughout the system. All of these new works have been carefully studied and criticised until the final designs as built will show, it is believed, proper stability, combined with lines pleasing to the eye. These two departments, while quite separate in organization, have of necessity to work side by side and consider each other in planning.

The Park Proper.

In addition to the usual works of maintenance a number of permanent improvements were provided for in the estimates, and all of these have either been finished or will be before the opening of the 1911 season. These works included new roads and footpaths, an increased water supply, planting of trees and shrubs, road experiment work, new bath houses and a section of iron and stone massive fencing along the edge of the cliff between Rambler's Rest and Inspiration Point. Over two thousand feet of new footpaths were constructed, principally between the Ferry Street boundary and the herbaceous garden, and near the foot of the bluff. These were substantially made of broken stone and filled with screenings. They will be continued to the Murray Street entrance, and prevent much of the annoyance from footpaths cut in the lawn areas. Along with the new work all the older paths have been retrimmed to improved lines and newly surfaced where necessary.

The new joint water supply by means of a 12-inch main has been completed from the Niagara Falls Pump House to Ferry Street and affords an ample supply and a greatly increased pressure. At the northern area of the Park a 4-inch auxiliary line for park purposes alone was installed to provide for the entrance lawns and beds.

The principal undertaking in tree and shrub planting was between the Canadian Niagara Power House and the Electrical Development Power House. This newly reclaimed area built out from the original water's edge has been surfaced and seeded after being uniformly graded to the levels of the redesigned roadway. The group type of planting has been adopted and carried out, comprising specimens of Norway Maple, the American Elm, Red Oak, Common Beech, Austrian Pine, Thuya and Common Red and White Cedar. The spacing and planting have been according to the design for this whole district, so that eventually it will form part of the arboretum with vistas looking upon the Upper Rapids from all of the interior paths and view points. This new made ground is for the most part made up of rock in large and small sizes with a slight covering of soil, and it required much labor to excavate for the depths required for specimen trees, but the results from this beginning will be carefully watched to improve upon extensions when they are undertaken. The early work of a similar nature upon the newly-made islands in and around the Ontario Power Company's Intake has been very disappointing with the deciduous stock, and the pit method of planting must yet be adopted or the type of

tree changed to the natural growth in this vicinity, the conifer. The evergreen would show to advantage and could form the pinetum district of the southerly portion of the Park blending in with the old Dufferin Islands growth. Much attention is being given to these matters at the present time to determine the style that will produce a pleasing and effective layout to harmonize with the surroundings and preserve the natural wooded areas that still remain after the changes made in developing power by water from the River.

The stone found in the Niagara District is for the most part limestone, and this material is used to the exclusion of nearly all others for road building and repairing. While some of the dolomitic varieties are fairly hard, the general supply of crusher run stone does not possess the hardness and toughness necessary for the surface required for the volume of traffic that has to be accommodated, and much time and effort has to be expended in upkeep that would be saved with a more permanent roadway. There is also the dust nuisance from the ease with which the top stone is worn into fine particles readily carried in clouds by the wind, and in wet weather the same layer becomes a pasty mass clinging to vehicles and pedestrians alike. One of the most difficult stretches of road, that in the immediate vicinity of the Horseshoe, was brick paved in 1908, and the result obtained both for traffic and economical maintenance more than justifies the expenditure. But this is the only section of the park roadways that has been surfaced with more than ordinary macadam requiring new metal each year and a considerable amount of labor during the summer season for dust suppression. Included in the estimates of expenditure for 1910 was a moderate appropriation for experimenting with modern materials and new methods of attacking the road problem. In all experimental sections were built of or treated with Light Road Oil, Tarvia B, Vulcan Fluid Asphalt, Rocmac and Glutrin, and upon these works careful observations are being made and the results noted for future guidance. The Light Road Oil, while not of a nature to give more than temporary benefits, lessens the cost of sprinkling for dust laying but must be charged with producing a layer of oil, water and dust, destructive to clothing in wet weather. The surface of the roads with this condition is rather dangerous for motor traffic. The refined tar product known commercially as Tarvia B and applied as a surface application to the cleanly swept road gave only temporary relief and scaled off with a few weeks' traffic. This material would in all probability give better results with a harder class of stone such as trap rock, as used in the New England States. Vulcan Fluid Asphalt, a heavy asphaltic base oil, was used after heating to apply by the penetration method to the surface of macadam construction before the final layer of screenings was applied to bind in the top course. This material did not have proper binding properties for applying in this manner and produced a creeping surface as a carpet before a roller. More satisfactory results would have been obtained by applying to the finished roadway and letting it penetrate, leaving a layer of the asphaltum on the surface. This would be little better than light oil and at a greater cost.

Toward the middle of the summer some information was obtained respecting a new preparation used in England and known as Rocmac, and designed for use on macadam work. After a brief inspection of some of this work in the course of construction near Rochester, New York, and an examination of a short length in Woodstock laid early in the season, it was decided to try the process on five hundred feet and this length was later increased to sixteen hundred feet. The method consists of mixing limestone screenings having a high percentage of calcium carbonate with Rocmac solution, a liquid product said to consist chiefly of sodium silicate and sugar. The matrix thus made is in the proportion of

limestone one cubic yard to fifteen or eighteen gallons of solution with enough water to form a mortar which is then spread upon the subgrade of the road, which has been already consolidated by rolling and shaped to the desired section. The matrix is placed in a layer of one and one-half inches over the road bed, and the two or three inch wearing course is then added to show when compacted by rolling a four inch finished course. The mortar coat is forced up through the interstices of the stone and bonds the whole into a water-proof coating which appears from experience here to withstand the wearing effect of traffic in a satisfactory manner and possesses the quality of bonding from time to time the particles that ravel out. The point selected for this treatment was from the end of the brick pavement to the Electric Railway intake, and later up to the Canadian Niagara Power House. This vicinity is visited by rain and spray at frequent intervals during the entire year, and is subject to the most severe frost action in the Fall and early Spring. If the road comes through the Winter and Spring as it promises to do a most efficient material for macadam work will be within reach for further use upon the Park drives and at a moderate cost.

Another product tried was Glutrin, a by-product from the destructive distilation of pulp wood. It contains the oils and resins from spruce wood and is applied to the surface of macadam before the final layer of screenings is spread upon the top course of stone for the last rolling. This was used upon a section of the main Park drive and proved distinctly successful, not only as a dust layer but in its bonding qualities under heavy traffic. With each rain the glutrin appeared to come to the surface area and re-consolidate the top road metal. This was one of the best pieces of road in the Park.

The swimming pond in the Dufferin Islands Elbow has been so well patronized that the old bath-houses became entirely inadequate to meet the requirements of the large numbers of children who daily visited the pond. Two new bath-houses with separate compartments were built within easy access of the steps into the water, and the top deck has been built as an observation point with a railing about the sides and ends. The roof of the structure, supported upon posts, protects visitors from the sun or rain. It will require the water supply to be extended to give running water for each house, and if electric lights were installed band concerts might be given in the evenings of the summer for the enjoyment of large numbers, who would be glad of an opportunity to visit the cool nook.

It was decided at the beginning of the year when the work was being planned to endeavor to complete the massive stone fence with ornate iron panelling from the Administration Building to the northerly extent of the Park at Ferry Road, where the boundary is now marked by a granite fencing. This work was to proceed in sections each year till the whole should be finished, and this season between eleven hundred and twelve hundred lineal feet was placed under contract between the Shelters at Rambler's Rest and Inspiration Point. The footing of concrete is placed ready for the large stone work which will be built with the opening Spring and before the summer season commences. When the whole front, of a little less than a mile, is finished it will present a splendid appearance both from the Park and from the opposite side of the river. It will also lend itself more readily to park treatment than the simple iron railing which it replaces. This is very noticeable at the Shelters themselves where extra surface is taken in, the wall being near the edge of the cliff and conforming to its contour.

The Ontario Power Company has been busily engaged during the entire year upon the construction work commenced in September, 1909, and notwithstanding every effort to hasten the work practically the whole of the southerly portion of



Electrical Development Power House.

the Park extending from the Company's Power House was torn up and unfit for development. In the late Fall permission was given to open up a further section of ground for the extension of the new conduit, this time as far as the southerly extremity of the Administration Building. This work, with the building of the overflow structure to regulate the water of No. 2 Conduit, will extend far into the summer at least and seriously curtail the picnic grounds immediately surrounding the Refectory. A number of fine trees have had to be sacrificed for these buildings but they have been removed in the winter season to another location at the Canadian Niagara Power House, where they will add much to the landscape in furnishing an immediate effect. The trees were removed with earth attached to the roots, by means of regular tree lifters supplied from a nearby nursery.

The restoration work upon the mile pipe line excavation was undertaken in the latter part of the season and some progress made near the head works, where the surface was terraced down from higher levels. This area will, of course, be disturbed again when the third conduit is built, and the present work, while effective, is not designed as the ultimate finish. The planting will be temporary to give an early effect, but very little expensive stock will be used. Large yardages of surface excavation still remain to be disposed of, although much of the rock has been crushed and used in concrete work.

The design for No. 2 Spillway as approved is circular in form, and it adjoins the present building for No. 1 Conduit, harmonizing generally with its architectural finish. It is hoped that these structures may be hidden from protruding themselves too prominently upon the view, and this will be the aim when planting can be undertaken.

Boulevard.

At the date of the last report one section of the roadway along the upper river had been completed and another finished, except for a six hundred foot length where an owner refused to accept the Commissioners' offer for the land required for right of way. It did not appear probable that any degree of success would attend further negotiations for lands, and additional contracts could not be entered into for continuous stretches on account of the high prices demanded. But with the adoption of the expropriation proceedings placed in the hands of the Board by the Government, possession was at once given and the only point at issue was the compensation to be paid. In several cases resistance was offered to the taking possession, but an Order of the Court in such instances secured peaceable entry and the works could proceed. Contracts were awarded for Section 1a, the Park to Chippawa (nearly one mile), Sections 2a and 2b, Chippawa to Black Creek (five and one-half miles), and Sections 3a and 3b, Black Creek to Miller's Creek (three miles). The section from the Park to Chippawa comprises the building of the road with the usual drainage and three steel-concrete cattle passes to provide access to the River from the lands abutting the roadway. At the entrance to the Park a very heavy clay cutting is being made through the high bank to allow of the grade of the road being on the same ascent as the Electric Railway. This provided filling for an old borrow pit and for depressions along the right of way, besides enough earth for some work in the Park itself.

The contract for work between Chippawa and Black Creek, signed June 6th, has been prosecuted with only a fair degree of vigor, much time being expended in gathering together a plant. This firm decided to bring all the stone needed in the rough to the site of the road, and installed a crushing plant to give the different

sizes required. The material is brought by scow and unloaded by a derrick upon a scow that may be moved as the work progresses. Some seven thousand lineal feet of macadam was laid to continue from Section No. 1 built in 1908, but the wet weather of the Fall prevented putting on the finishing coat and rolling it to grade. Every effort is being made to open up work in the Spring with a proper complement of men to finish the whole by July as required by the contract.

The section between Black Creek and Miller's Creek, near the Shipyard, was commenced in June at the southerly end to work toward Black Creek, there to connect with the preceding section. About one mile of the length was completed ready for traffic, leaving two miles still to work upon. This is also to be hastened with all possible dispatch to connect up at the same time as Sections 2a and 2b.

In November, 1910, two other contracts were awarded for the roadway through the Village of Chippawa and through the settlement of Cozy Dell, completing the various lengths chargeable to the debenture issue. One other section remains, namely, around the Shipyard property, but the cost of this is provided for by a payment from the Companies operating the plant. Five reinforced concrete bridges are being advertised for tenders to span the five water courses draining into the Niagara River. These are made twenty feet in width, except the one at Black Creek, where a sidewalk is also provided for owing to the settlement located there.

Outlying Parks.

Queenston.—The pathway from the entrance gates has been extended to Brock's Monument and the steep cutting has been sodded to show a green slope. During the winter many pines and cedars were selected from the grounds where the growth was thick and planted along the sides of the new path near the entrance and the results were quite successful. Plans were prepared for improving the ball grounds by grading the surface to new lines and levels. This play ground is in constant use during the summer and needed attention for both the visitors and the caretakers who were handicapped from the uneven surface. During the summer the Dominion Government erected a monument to the memory of Laura Secord at a point midway between the entrance and Brock's Shaft. This is a neat design of Vermont granite with a bronze bust of Laura Secord, facing the main path. It is twelve feet in height and occupies a recess overlooking the Niagara River, the exact site of the first monument to General Brock. The Laura Secord Shaft is to have a parapet wall extending out in front of it toward Queenston to give it a setting and also to provide a view point for looking over the lower expanse of river. A work of considerable extent is being carried out in front of Brock's Monument itself, where a promenade is being constructed so as to extend the level area farther out and increase the space for viewing what is said to be one of the most impressive pastoral scenes on this continent. All of this new work will be completed before the summer visitors come. The restaurant was again increased to provide a much larger dining-room and its space is still inadequate for the services demanded.

The usual maintenance work has all been performed at the other outlying parks the Glen, Lundy's Lane, and Fort Erie, and considerable permanent improvement work has been done at Lundy's Lane, where the grounds had become very badly in need of proper care and supervision.

All respectfully submitted.

John H. Jackson,
Superintendent.

APPENDIX "I."

Contract for the Construction of the Niagara River Boulevard.

Section No. 1a.

THIS AGREEMENT made (in triplicate) this 18th day of May A.D. 1910,

BY AND BETWEEN the Commissioners for the Queen Victoria Niagara Falls Park, of the first part, and

The Queenston Quarry Company of the Village of St. David's, and

T. E. Ferris, of the City of Niagara Falls, both in the Province of Ontario, Contractors, of the second part.

WITNESSETH:

1. That the said party of the first part has let and awarded to the Contractors, and in consideration of the convenants and agreements herein contained on the part of the Contractors, to be kept and performed by them, does hereby let and award to the said Contractors, the following described work or contract, upon the following terms and conditions and specifications, hereunto annexed, and in accordance with the plans thereof on file in the Office of the Commission at Niagara Falls, all of which form a part of this contract.

2. The work to be done and the materials to be furnished under this contract are described as being the construction of Section No. 1A of the Niagara River Boulevard, a distance of 4,636 lineal feet.

3. And the said Contractors, in consideration of the letting and awarding to them of the said contract and work, and in consideration of the payments hereinafter mentioned, to be made to them by the said Commission and under the penalty expressed in a Bond bearing even date with these presents and hereunto annexed, hereby agree at their own proper cost and expense to do all the work, furnish all the material above set forth, according to the true intent and meaning of the specifications and conditions herein contained.

4. And do further agree that the said Commission shall be and are hereby authorized to appoint an Engineer of the said Boulevard, and such assistants and inspectors as they may deem proper, to inspect the works to be done under this agreement, and to see that the same strictly correspond with the specifications hereunto annexed.

5. To prevent all disputes and litigation, it is further agreed by and between the parties to this contract that the Engineer of the said Boulevard shall in all cases determine the amounts or quality of work to be done, and which are to be paid for under this contract or in connection with said Boulevard construction, and he shall decide all questions which may arise relative to the execution of the contract, or to said construction on the part of the Contractors, and his estimates, directions, and decisions shall be final and conclusive and binding upon the said Contractors.

6. It is understood that whatever conditions and specifications are mentioned herein, the conditions and specifications hereunto annexed are referred to, and the same are to be taken as a part of this contract and construed therewith.

7. And it is further agreed that this contract shall be executed in triplicate, one of which triplicates shall be kept by the said Commission, one to be kept by the said Engineer, and one to be delivered to the Contractors.

8. And the said Contractors hereby agree to receive the following prices as full compensation for the use of forms, tools, patterns, plant, implements, and machinery, including all transportation, etc., for the same, and for all the labour for

executing all the work contemplated in this contract; for all bailing, draining, and pumping of water; for all loss or damage arising out of the work aforesaid, or from the action of the elements, or from any unforeseen destruction or difficulties which may be encountered in the prosecution of the same, and for all risk of every description connected with the work, also for all expenses incurred by or in consequence of the suspension or discontinuance of the said works (in case the Engineer should so direct), and for well and faithfully completing the work and the whole thereof in the manner according to the plans and specifications and the requirements of the Engineer under them; being distinctly understood that there shall be no claim for any extra work except as herein specially provided for; also the furnishing (including transportation) of all the materials necessary for the full completion of the work, and the keeping of the works in repair and in good working order, until the final payments are made, the whole of the work to be completed according to the plans and specifications for the lump sum of Fourteen thousand five hundred and sixty-six and 50-100 ($14,566.50) dollars, and further agree to any combination of the following additions to deductions per item to or from the work shown on the plan, and described in clause 7 of this contract, namely:

The addition or deduction of:

(a). Earth excavation, including disposal, forty (40) cents per cubic yard.

(b). Laying of concrete tile—

8-inch and 12-inch, twenty-five (25) cents per lineal foot.

15-inch and 18-inch, fifty (50) cents per lineal foot.

(c). Furnishing and laying 4-inch tile drain, fifteen (15) cents per lineal foot.

(d). Macadam roadway complete, one dollar ($1.00) per square yard of roadway.

9. The work embraced in this contract shall be begun within three (3) days after notice so to do shall have been given to the Contractors by the Engineer, and carried on regularly and uninterruptedly thereafter with such a force as to secure its full completion on or before 15th September, 1910, and such portions thereof shall be completed in each month as the Engineer shall determine is a fair proportion thereof.

10. And the said parties of the second part hereby further agree that the said party of the first part shall be and is hereby authorized to deduct and retain out of the moneys which may be due or become due to the said party of the second part under this agreement as damages for the non-completion of the work aforesaid within the time hereinbefore stipulated for its completion, or within such further time as in accordance with the provisions of this agreement shall be fixed or allowed for such performance or completion, the sum of One hundred ($100) dollars per day for each and every day, the time employed upon the said work may exceed the time stipulated for its completion or such stipulated time as the same may be increased as hereinbefore provided, which said sum of One hundred ($100) dollars per day is hereby, in view of the difficulty of estimating such damages agreed upon, fixed and determined by the parties hereto as the liquidated damages that the party of the first part will suffer by reason of such default and not by way of penalty.

11. The party of the first part reserves the right of suspending the whole or any part of the work herein contracted to be done if it is deemed to be for the best interest of the Commission so to do without compensation to the Contractors for such suspension other than extending the time for completing the work as long a time as it may have been delayed by such suspension.



Picnic Grounds.

12. No charge shall be made by the Contractors for hindrance or delay from any cause during the progress of the work embraced in this contract.

13. The said Contractors further agree that they will give personal attention constantly to the faithful prosecution of the work, and will not assign or sub-let the work or any part thereof or any of the moneys or orders payable under the contract without the previous written consent of the Commission, but will keep the same under their personal control; that no right under this contract nor to any orders or monies due or to become due hereunder shall be asserted against the said Commission or any member or officers thereof, by reason of any so-called assignment shall have been authorized by the written consent of the Commission, that no person other than the parties signing this agreement as the Contractors hereby now have any claim hereunder; that no claim shall be made except under a specific clause of this agreement by any person whatever.

14. In the event of the Contractors failing or neglecting for one month to pay the wages of the men and teams employed on the works, the Commission, on the representation of the Engineer, reserve to themselves the right to pay all such wages ascertained to be due and to deduct the amount of the same from any monies due or becoming due to the Contractors upon this or any other contract.

15. It shall be lawful for the said Commission in case the said Contractors shall fail in the due performance of any part of their undertaking or shall become bankrupt or insolvent or shall compound their creditors or propose any composition with their creditors for the settlement of their debts, or shall carry on or propose to carry on their business under inspectors on behalf of their creditors, or shall commit any act of bankruptcy, to relet the undertaking of said contract or any part thereof, and upon such conditions as it may think fit, or from time to time may engage workmen and provide all such material, implements and apparatus and employ the same in such manner as the said Engineer may think necessary and proper for completing the said work, or any part of them, and any loss, damage or deficiency that may arise in consequence of said bankruptcy or failure on part of the Contractors shall be paid and deducted out of any money retained by said Commission out of any work previously performed by said Contractors, and should said money so retained be not sufficient to indemnify and cover such losses, the deficiency then due shall be a charge on the bond accompanying this instrument.

16. If the said Contractors are not, in the opinion of the Engineer, proceeding with the work expeditiously, continuously and in accordance with the terms of this contract, and to the satisfaction of the said Engineer, and so as to ensure in his opinion a satisfactory completion and delivery to the Commission by the date herein provided, and should the Engineer so certify to the Commission in writing, the said Commission shall thereupon require the said Contractors to proceed without delay with such force as may be directed, and in case of their refusal or neglect to completely comply with such requirements within three (3) days after being notified so to do, the said Commission may take possession of and complete said work at the expense of said Contractors as herein provided in case of failure or insolvency.

17. The Contractors shall deliver to the Engineer accounts for extra work duly ordered in the manner hereinbefore mentioned and provided in specifications signed by himself or agent, and such accounts will be paid in full within five (5) weeks upon the Engineer's certificate for their correctness, and no claim whatever will be considered for works not so included in such account. Such payments on extra work shall not be construed, however, as an acceptance of any such work, and shall not lessen the liability of the Contractors to replace defective work, though the condi-

tions of the same may not have been known to the Engineer at the time his certificate was given or acted upon.

18. In order to enable the Contractors to prosecute the work advantageously, the Engineer shall on or about the last Saturday of each month make an estimate in writing of the amount of work done and materials delivered to be used on the work and of the value thereof according to the terms of this contract. The first such estimate shall be of the amount for quantity and value of the work done and materials delivered since the Contractors commenced the performance of this contract on their part. And every subsequent estimate, except the final one, shall be of the amount or quantity and value of the work done since the last preceding estimate was made. And such estimate of the amount and quantity shall not be required to be made by strict measurement, or with exactness, but they may at the option of the Engineer be approximate only. And upon such estimate being made the Commission will pay to the Contractors eighty (80) per cent. of such estimated value.

19. The Contractors hereby further agree to make all the needed repairs in the said work during a period of nine months after its final completion; and they hereby further agree that the Commission is authorized to retain out of the monies payable or to become payable to him under this agreement the sum of five (5) per cent. on the amount of the contract, and to expend the same or so much thereof as may be required in making the aforesaid repairs to the satisfaction of the Engineer, if after the delivery or mailing of a notice in writing to the Contractors or their agent he shall neglect to make the aforesaid needed repairs within the time specified in such notice, and they (the Contractors) hereby further agree to be responsible for any accident that may occur on account of the defective conditions of the work.

20. It is further mutually agreed that whenever this contract, in the opinion of the Engineer, shall be completely performed on the part of the Contractors, the Engineer shall proceed with all reasonable diligence to measure up the work, if need be, and shall make out the final estimate for the same, and shall certify the same; and upon the expiration of sixty (60) days after the acceptance by the Commission of the work herein agreed to be done by the Contractors, the said Commission will pay to the said Contractors the amount remaining after deducting from the value named in the last mentioned (final) certificate, all such sums as shall previously have been paid to the said Contractors under any of the provisions of the contract, and also such sums of money as by the terms they are authorized to reserve or retain, provided that nothing herein contained shall be construed to affect the right hereby reserved by the said Commission to reject the whole or any portion of the aforesaid work should the said certificate be found or known to be inconsistent with the terms of this agreement or otherwise improperly given.

21. And it is hereby agreed that the said Contractors shall indemnify and save harmless the Commission from and against all claims against the said Commission for all labor done and materials furnished under this contract, and shall furnish the said Commission with satisfactory evidence, when requested, that all persons who have done work or furnished materials under this contract for which the Commission might become liable, have been fully paid or satisfactorily secured; and in case such evidence is not furnished, an amount necessary and sufficient to meet the claims of persons aforesaid shall be retained from money due, the said Contractors under this contract, until the liabilities aforesaid shall be fully discharged or satisfactorily secured.

22. And the Contractors agree that they will execute and deliver to the said Commission a bond by an approved Surety Company in the sum of $3,500 for the faithful performance of the contract, conditioned to indemnify and save harmless the said Commission from all suits or actions of every name and description brought against the said Commission for or on account of any damages received or sustained by any party or parties, by or from the said Contractors, their servants or agents, in the construction of the said works, or by or in consequence of any negligence in guarding the same, or any improper materials furnished by the Contractor used in its construction, or by or on account of any act or omission of the said Contractors, and that the Contractors will faithfully perform this contract according to the true intent and meaning thereof; and the said Contractors hereby further agree that so much of the money due to them under and by virtue of this agreement as shall be considered necessary by the said Commission may be retained by the said Commission until all such suits or claims for damages, as aforesaid, shall have been settled, and evidence to that effect furnished to the satisfaction of the said Commission.

23. This agreement shall enure to the benefit of and be binding upon the successors and assigns of the Commission and the heirs, executors, administrators and assigns of the said Contractors, as well as upon the Commission and Contractors.

IN WITNESS THEREOF the parties to these presents have hereunto set their hands and seals, the day and year herein first written.

SIGNED, SEALED AND DELIVERED
In the presence of

THE COMMISSIONERS FOR THE
QUEEN VICTORIA NIAGARA FALLS PARK.

J. W. Langmuir,
Chairman.
[Seal]

QUEENSTON QUARRY CO.

Chas. Lourey,
President.

T. E. Ferris.
[Seal]

Jennie F. Quillinan.

The Commissioners for the Queen Victoria Niagara Falls Park, acting in pursuance of Section 49 of the Ontario Public Works Act, hereby accept the above written contract with the parties therein named of the second part, and all the provisions thereof, as well on behalf of them, the said Commissioners in their Corporate capacity, and also in the name and on behalf of his Majesty the King, and in witness whereof the Chairman, as duly authorized, has affixed the Corporate Seal and his own signature on the day and year first above written.

J. W. Langmuir,
Chairman.

APPENDIX "J."

Contract for the Construction of the Niagara River Boulevard.

Sections Nos. 2A, 2B.

THIS AGREEMENT, made (in triplicate) this 6th day of June, A.D. 1910,

BY AND BETWEEN The Queen Victoria Niagara Falls Park Commission, of the first part, and

H. A. Campaigne, Wm. Ward, John Ward, Wm. Upper, and Chas. Lobb, trading under the firm name of "Campaigne & Company," of the second part.

WITNESSETH:

1. That the said party of the first part has let and awarded to the Contractor, and in consideration of the covenants and agreements herein contained on the part of the Contractor to be kept and performed by him, does hereby let and award to the said Contractor, the following described work or contract, upon the following terms and conditions and specifications, hereunto annexed, and in accordance with the plans thereof on file in the Office of the Commission at Niagara Falls, all of which form a part of this contract.

2. The work to be done and the materials to be furnished under this contract are described as being the construction of Sections Nos. 2A and 2B of the Niagara River Boulevard, distances respectively of 14,000 and 15,100 lineal feet.

3. And the said Contractor in consideration of the letting and awarding to him of the said contract and work, and in consideration of the payments hereinafter mentioned, to be made to him by the said Commission, and under the penalty expressed in a Bond bearing even date with the presents and hereunto annexed, hereby agrees at his own proper cost and expense to do all the work, furnish all materials above set forth, according to the true intent and meaning of the specifications and conditions herein contained.

4. And does further agree that the said Commission shall be and are authorized to appoint an Engineer of the said Boulevard, and such assistants and inspectors as they may deem proper to inspect the work to be done under this agreement and to see that the same strictly corresponds with the specifications hereunto annexed.

5. To prevent all disputes and litigation, it is further agreed by and between the parties to this contract that the Engineer of the said Boulevard shall in all cases determine the amounts or quality of work to be done and which are to be paid for under this contract or in connection with said Boulevard construction, and he shall decide all questions which may arise relative to the execution of the contract or to said construction on the part of the Contractor, and his estimates, directions and decisions shall be final and conclusive and binding upon the said Contractor.

6. It is understood that whatever conditions and specifications are mentioned herein, the conditions and specifications hereunto annexed are referred to, and the same are to be taken as a part of this contract and construed therewith.

7. And it is further agreed that this contract shall be executed in triplicate, one of which triplicates shall be kept by the said Commission, one to be kept by the said Engineer, and one to be delivered to the Contractor.

8. And the said Contractor hereby agrees to receive the following lump sum and prices as full compensation for the use of forms, tools, patterns, plant, implements and machinery, including all transportation, etc., for the same, and for all the labor for executing all the work contemplated in this contract; for all bailing,

draining and pumping of water; for all loss or damage arising out of the aforesaid work, or from the action of the elements or from any unforeseen destruction or difficulties which may be encountered in the prosecution of the same, and for all risk of every description connected with the work, also for all expenses incurred by or in consequence of the suspension or discontinuance of the said works (in case the Engineer should so direct), and for the providing of such labor as the Engineer may require from time to time to assist him in the staking and laying out of the work and for well and faithfully completing the work and the whole thereof in the manner and according to the plans and specifications and the requirements of the Engineer under them; it being distinctly understood that there shall be no claim for any extra work except as herein specially provided for; also the furnishing (including transportation) of all the materials necessary for the full completion of the work, and the keeping of the works in repair and in good working order, until the final payments are made, the whole work to be completed according to the plans and specifications for the lump sum price of Sixty-six thousand nine hundred and fifty ($66,950.00) dollars, and further agrees to any combination of the following additions and deductions per item, to or from the work shown on plans and described generally in clause 2 of this contract, and specifically in the specifications hereunto attached, namely:

The addition or deduction of:

(a). Excavation, including disposal, forty (40) cents per cubic yard.

(b). Concrete Tile (furnished by the Commission) complete, as follows:

8-inch, thirty (30) cents per lineal foot.
12 " thirty-five (35) cents per lineal foot.
15 " forty-five (45) cents per lineal foot.
18 " fifty-five (55) cents per lineal foot.
24 " seventy (70) cents per lineal foot.

(c). Construction of three (3) feet by two (2) feet, six (6) inch reinforced concrete box culverts, as follows:

Single box, Two dollars and fifty cents ($2.50) per lineal foot.
Twin box, Four dollars and fifty cents ($4.50) per lineal foot.

(d) Construction of catch basins complete, twelve ($12.00) per pair.

(e). Furnishing and laying four (4) inch tile drain, ten (10) cents per lineal foot.

9. The work embraced in this contract shall be begun within three (3) days after notice so to do shall have been given to the Contractor by the Engineer, and carried on regularly and uninterruptedly thereafter with such a force as to secure its full completion on or before the 15th July, 1911, and such portions thereof shall be completed in each month as the Engineer shall determine is a fair proportion thereof.

10. And the said party of the second part further agrees that the said party of the first part shall be and is hereby authorized to deduct and retain out of the monies which may be due or become due to the said party of the second part under this agreement as damages for the non-completion of the work aforesaid within the time hereinbefore stipulated for its completion, or within such further time as in accordance with the provisions of this agreement shall be fixed or allowed for such performance or completion, the sum of One Hundred ($100.00) dollars per day for each and every day the time employed upon the said work may exceed the time stipulated for its completion or such stipulated time as the same may be increased as hereinbefore provided, which said sum of One hundred ($100.00) dollars per day is hereby, in view of the difficulty of estimating such damages agreed upon,

fixed and determined by the parties hereto as the liquidated damages that the party of the first part will suffer by reason of such default and not by way of penalty.

11. The party of the first part reserves the right of suspending the whole or any part of the work herein contracted to be done if it is deemed to be for the best interest of the Commission so to do, without compensation to the Contractor for such suspension other than extending the time for completing the work as long a time as it may have been delayed by such suspension.

12. No charge shall be made by the Contractor for hindrance or delay from any cause during the progress of the work embraced in this contract.

13. The said Contractor further agrees that he will give personal attention constantly to the faithful prosecution of the work, and will not assign or sub-let the work or any part thereof or any of the monies or orders payable under the contract without the previous written consent of the Commission, but will keep the same under his personal control; that no right under this contract nor to any orders or monies due or to become due hereunder shall be asserted against the said Commission of any members or officers thereof, by reason of any so-called assignment in law or equity of this contract or any part thereof, or of any monies or orders payable thereunder unless such assignments shall have been authorized by the written consent of the Commission; that no person other than the party signing this agreement as the Contractor hereby now have any claim hereunder; that no claim shall be made except under a specific clause of this agreement by any person whatever.

14. In the event of the contractor failing or neglecting for one (1) month to pay the wages of the men and teams employed on the works, the Commission, on the representation of the Engineer, reserve to themselves the right to pay all such wages ascertained to be due and to deduct the amount of the same from any monies due or coming due to the Contractor upon this or any other contract.

15. It shall be lawful for the said Commission in case the said Contractor shall fail in the due performance of any part of his undertaking or shall become bankrupt or insolvent or shall compound with his creditors or propose any composition with his creditors for the settlement of his debts, or shall carry on or propose to carry on his business under inspectors on behalf of his creditors, or shall commit any act of bankruptcy, to re-let the undertaking of said contract or any part thereof, and upon such condition as it may think fit, or from time to time may engage workmen and provide all such materials, implements and apparatus, and employ the same in such manner as the said Engineer may think necessary and proper for completing the said works, or any part of them, and any loss, damage or deficiency that may arise in consequence of said bankruptcy or failure on part of the Contractor shall be paid and deducted out of the money retained by said Commission out of any work previously performed by said Contractor, and should said money so retained be not sufficient to indemnify and cover such losses, the deficiency then due shall be a charge on the Bond accompanying this instrument.

16. If the said Contractor is not, in the opinion of the Engineer, proceeding with the work expeditously, continuously and in accordance with the terms of this contract, and to the satisfaction of the said Engineer, and so as to ensure in his opinion a satisfactory completion and delivery to the Commission by the date herein provided, and should the Engineer so certify to the Commission in writing, the said Commission shall thereupon require the said Contractor to proceed without delay with such force as may be directed, and in case of his refusal or neglect to completely comply with such requirement within three (3) days after being notified so to do, the said Commission may take possession of and complete said work at the expense of said Contractor as herein provided in case of failure or insolvency.

17. In order to enable the Contractor to prosecute the work advantageously, the Engineer shall on or about the last Saturday of each month make an estimate in writing of the amount of work done and materials delivered to be used in the work and of the value thereof, according to the terms of this contract. The first such estimates shall be of the amount or quantity and value of the work done and materials delivered since the Contractor commenced the performance of this contract on his part. And every subsequent estimate, except the final one, shall be of the amount or quantity and value of the work done since the last preceding estimate was made. And such estimates of the amount and quantity shall not be required to be made by strict measurement or with exactness, but they may, at the option of the Engineer, be approximate only. And upon such estimate being made the Commission will pay to the Contractor eighty (80) per cent. of such estimated value.

18. The Contractor shall deliver to the Engineer for extra work, not covered by an established price, as mentioned in Clauses 6 and 7 of the specifications hereunto attached, signed by himself or agent, on or before the 3rd day of the month following that in which said extra work was done, and such accounts will be paid in full within five (5) weeks upon the Engineer's certificate for their correctness, and no claim whatever will be considered for works not so included in such account. Such payments on extra work shall not be construed, however, as an acceptance of any such work, and shall not lessen the liability of the Contractor to replace defective work, though the conditions of the same may not have been known to the Engineer at the time his certificate was given or acted upon.

19. The Contractor hereby further agrees to make all the needed repairs in the said work during a period of nine (9) months after its final completion, and he hereby further agrees that the Commission is authorized to retain out of the monies payable or to become payable to him under this agreement, the sum of five (5) per cent. on the amount of the contract, and to expend the same, or so much thereof as may be required, in making the aforesaid repairs to the satisfaction of the Engineer, if after the delivery or mailing of a notice in writing to the Contractor or his agent, he shall neglect to make the aforesaid needed repairs within the time specified in such notice, and he (the Contractor) hereby further agrees to be responsible for any accident that may occur on account of the defective condition of the work.

20. It is further mutually agreed, that whenever this contract, in the opinion of the Engineer, shall be completely performed on the part of the Contractor, the Engineer shall proceed, with all reasonable diligence, to measure up the work, if need be, and shall make out the final estimate for the same, and shall certify the same, and upon the expiration of sixty (60) days after the acceptance by the Commission of the work herein agreed to be done by the Contractor, the said Commission will pay to the said Contractor the amount remaining after deducting from the amount or value named in the last mentioned (final) certificate all such sums as shall previously have been paid to the said Contractor under any of the provisions of the contract, and also such sums of money as by the terms they are authorized to reserve or retain, provided that nothing herein contained shall be construed to affect the right hereby reserved by the said Commission to reject the whole or any portion of the aforesaid work should the said certificate be found or known to be inconsistent with the terms of this agreement, or otherwise improperly given.

21. It is hereby agreed that the said Contractor shall indemnify and save harmless the Commission from and against all claims against the said Commission for all labor done and materials furnished under this contract, and shall furnish the said Commission with satisfactory evidence, when requested, that all persons

who have done work or furnished materials under this contract, for which the Commission might become liable, have been fully paid or satisfactorily secured; and in case such evidence is not furnished, an amount necessary and sufficient to meet the claims of persons aforesaid shall be retained from money due the said Contractor under this contract, until the liabilities aforesaid shall be fully discharged or satisfactorily secured.

22. And the Contractor agrees that he will indemnify and save harmless the said Commission from all suits or actions of every name and description brought against the said Commission, for or on account of any damages received or sustained by any party or parties, by or from the said Contractor, his servants or agents, in the construction of the said works, or by or in consequence of any negligence in guarding the same, or any improper materials furnished by the Contractor, used in its construction, or by or on account of any act or omission of the said Contractor, and that the Contractor will faithfully perform this contract according to the true intent and meaning thereof; and the said Contractor hereby further agrees that so much of the money due to him under and by virtue of this agreement as shall be considered necessary by the said Commission, may be retained by the said Commission until all such suits or claims for damages, as aforesaid, shall have been settled and evidence to that effect furnished to the satisfaction of the said Commission.

23. And the Contractor further agrees that he will execute and deliver to the said Commission a Bond by an approved Surety Company, in the sum of Twenty thousand ($20,000.00) dollars providing for the carrying out of the work according to this contract and the specifications hereunto attached.

24. This agreement shall enure to the benefit of and be binding upon the successors and assigns of the Commission, and the heirs, executors, administrators and assigns of the said Contractor, as well as upon the Commission and Contractor.

IN WITNESS THEREOF the parties to these presents have hereunto set their hands and seals, the day and year herein first written.

SIGNED, SEALED AND DELIVERED
In the presence of

QUEEN VICTORIA NIAGARA FALLS PARK COMMISSIONERS.

J. W. Langmuir,
Chairman.

H. A. Campaigne.
Wm. Upper.
Charles Lobb.
Wm. Ward.
John Ward.

[Seal.]

A. C. Preston.

The Commissioners for the Queen Victoria Niagara Falls Park, acting in pursuance of Section 49 of the Ontario Public Works Act, hereby accept the above written contract with the parties therein named of the second part, and all the provisions thereof, as well on behalf of them, the said Commissioners in their Corporate capacity, and also in the name and on behalf of his Majesty the King, and in witness whereof the Chairman, as duly authorized, has affixed the Corporate Seal and his own signature on the day and year first above written.

J. W. Langmuir,
Chairman.

APPENDIX "K."

Contract for the Construction of the Niagara River Boulevard.

Sections Nos. 3A, 3B.

THIS AGREEMENT, made (in triplicate) this 31st day of May, A.D. 1910,

BY AND BETWEEN The Queen Victoria Niagara Falls Park Commission, of the first part, and

Benjamin A. Cook and Eugene H. Menzie, trading as Cook & Menzie, both of the City of Niagara Falls, in the Province of Ontario, of the second part.

WITNESSETH:

1. That the said party of the first part has let and awarded to the Contractors, and in consideration of the covenants and agreements herein contained on the part of the Contractors to be kept and performed by them, does hereby let and award to the said Contractors, the following described work or contract, upon the following terms and conditions and specifications, hereunto annexed, and in accordance with the plans thereof on file in the Office of the Commission at Niagara Falls, all of which form a part of this contract.

2. The work to be done and the materials to be furnished under this contract are described as being the construction of Sections Nos. 3A, 3B of the Niagara River Boulevard, distances respectively of 8,300 and 8,400 lineal feet.

3. And the said Contractors, in consideration of the letting and awarding to them of the said contract and work, and in consideration of the payments hereinafter mentioned, to be made to them by the said Commission, and under the penalty expressed in a Bond bearing even date with the presents and hereunto annexed, hereby agree at their own proper cost and expense to do all the work, furnish all materials above set forth, according to the true intent and meaning of the specifications and conditions herein contained.

4. And do further agree that the said Commission shall be and are hereby authorized to appoint an Engineer of the said Boulevard, and such assistants and inspectors as they may deem proper to inspect the work to be done under this agreement, and to see that the same strictly corresponds with the specifications hereunto annexed.

5. To prevent all disputes and litigation, it is further agreed by and between the parties to this contract that the Engineer of the said Boulevard shall in all cases determine the amounts or quality of work to be done and which are to be paid for under this contract or in connection with said Boulevard construction, and he shall decide all questions which may arise relative to the execution of the contract or to said construction on the part of the Contractors, and his estimates, directions and decisions shall be final and conclusive and binding upon the said Contractors.

6. It is understood that whatever conditions and specifications are mentioned herein, the conditions and specifications hereunto annexed are referred to, and the same are to be taken as a part of this contract and construed therewith.

7. And it is further agreed that this contract shall be executed in triplicate, one of which triplicates shall be kept by the said Commission, one to be kept by the said Engineer, and one to be delivered to the Contractors.

8. And the said Contractors hereby agree to receive the following lump sum and prices as full compensation for the use of forms, tools, patterns, plant, implements and machinery, including all transportation, etc., for the same, and for all the labor for executing all the work contemplated in this contract; for all bailing,

draining and pumping of water; for all loss or damage arising out of the work aforesaid, or from the action of the elements, or from any unforeseen destruction or difficulties which may be encountered in the prosecution of the same, and for all risk of every description connected with the work, also for all expenses incurred by or in consequence of the suspension or discontinuance of the said works (in case the Engineer should so direct), and for the providing of such labor as the Engineer may require from time to time to assist him in the staking and laying out of the work, and for well and faithfully completing the work and the whole thereof in the manner and according to the plans and specifications and the requirements of the Engineer under them; it being distinctly understood that there shall be no claim for any extra work except as herein specially provided for; also the furnishing (including transportation) of all materials necessary for the full completion of the work; and the keeping of the works in repair, and in good working order, until the final payments are made, the whole work to be completed according to the plans and specifications for the lump sum price of Twenty-six thousand seven hundred and twenty-nine and 51-100 ($26,729.51) dollars, and further agree to any combination of the following additions and deductions per item, to or from the work shown on plans and described generally in clause 2 of this contract, and specifically in the specifications hereunto attached, namely:

The addition or deduction of:

(*a*) Excavation, including disposal, forty (40) cents per cubic yard.

(*b*) Concrete Tile (furnished by the Commission) complete, as follows:

8-inch, thirty (30) cents per lineal foot.

12-inch, thirty-five (35) cents per lineal foot.

15-inch, forty-five (45) cents per lineal foot.

18-inch, fifty-five (55) cents per lineal foot.

24-inch, seventy(70) cents per lineal foot.

(*c*) Construction of three (3) foot by two (2) foot, six (6) inch reinforced concrete Box Culverts, as follows:

Single box, two dollars and fifty ($2.50) cents per lineal foot.

Twin box, four dollars and fifty ($4.50) cents per lineal foot.

(*d*) Construction of Catch Basins complete, twelve ($12.00) dollars per pair.

(*e*) Furnishing and laying four (4) inch tile drain, ten (10) cents per lineal foot.

9. The work embraced in this contract shall be begun within three (3) days after notice so to do shall have been given to the contractors by the Engineer, and carried on regularly and uninterruptedly thereafter with such a force as to secure its full completion on or before Oct. 15th, 1910, and such portions thereof shall be completed in each month as the Engineer shall determine is a fair proportion thereof.

10. And the said parties of the second part hereby further agree that the said party of the first part shall be and is hereby authorized to deduct and retain out of the monies which may be due or become due to the said party of the second part under this agreement as damages for the non-completion of the work aforesaid within the time hereinbefore stipulated for its completion, or within such further time as in accordance with the provisions of this agreement shall be fixed or allowed for such performance or completion, the sum of one hundred dollars ($100.00) per day for each and every day the time employed upon the said work may exceed the time stipulated for its completion or such stipulated time as the same may be increased as hereinbefore provided, which said sum of one hundred dollars ($100.00) per day is hereby in view of the difficulty of estimating such

damages agreed upon, fixed and determined by the parties hereto as the liquidated damages that the party of the first part will suffer by reason of such default and not by way of penalty.

11. The party of the first part reserves the right of suspending the whole or any part of the work herein contracted to be done if it is deemed to be for the best interest of the Commission so to do, without compensation to the Contractors for such suspension other than extending the time for completing the work as long a time as it may have been delayed by such suspension.

12. No charge shall be made by the Contractors for hindrance or delay from any cause during the progress of the work embraced in this contract.

13. The said Contractors further agree that they will give personal attention constantly to the faithful prosecution of the work and will not assign or sub-let the work or any part thereof or any of the monies or orders payable under the contract without the previous written consent of the Commission, but will keep the same under their personal control; that no right under this contract nor to any orders or monies due or to become due hereunder shall be asserted against the said Commission or any members or officers thereof, by reason of any so-called assignment in law or equity of this contract or any part thereof, or of any monies or orders payable thereunder unless such assignments shall have been authorized by the written consent of the Commission; that no person other than the parties signing this agreement as the Contractors hereby now have any claim hereunder; that no claim shall be made except under a specific clause of this agreement by any person whatever.

14. In the event of the Contractors failing or neglecting for one (1) month to pay the wages of the men and teams employed on the works, the Commission on the representation of the Engineer, reserve to themselves the right to pay all such wages ascertained to be due and to deduct the amount of the same from any monies due or coming due to the Contractors upon this or any other contract.

15. It shall be lawful for the said Commission, in case the said Contractors shall fail in the due performance of any part of their undertaking or shall become bankrupt or insolvent or shall compound with their creditors or propose any composition with their creditors for the settlements of their debts, or shall carry on or propose to carry on their business under inspectors on behalf of their creditors, or shall commit any act of bankruptcy, to relet the undertaking of said contract or any part thereof, and upon such condition as it may think fit, or from time to time may engage workmen and provide all such materials, implements and apparatus, and employ the same in such manner as the said Engineer may think necessary and proper for completing the said work, or any part of them, and any loss, damage or deficiency that may arise in consequence of said bankruptcy or failure on the part of the Contractors shall be paid and deducted out of the money retained by said Commission out of any work previously performed by said Contractors, and should said money so retained be not sufficient to indemnify and cover such losses, the deficiency then due shall be a charge on the bond accompanying this instrument.

16. If the said Contractors are not, in the opinion of the Engineer, proceeding with the work expeditiously, continuously and in accordance with the terms of this contract, and to the satisfaction of the said Engineer, and so as to ensure, in his opinion, a satisfactory completion and delivery to the Commission by the date herein provided, and should the Engineer so certify to the Commission in writing, the said Commission shall thereupon require the said Contractors to proceed without delay with such force as may be directed, and in case of their refusal or neglect to completely comply with such requirement within three (3) days after being notified so

to do, the said Commission may take possession of and complete said work at the expense of said Contractors as herein provided in case of failure or insolvency.

17. In order to enable the Contractors to prosecute the work advantageously, the Engineer shall on or about the last Saturday of each month make an estimate in writing of the amount of work done and materials delivered to be used in the work and of the value thereof according to the terms of this contract. The first such estimate shall be of the amount or quantity and value of the work done and materials delivered since the Contractors commenced the performance of this contract on their part. And every subsequent estimate, except the final one, shall be of the amount or quantity and value of the work done since the last preceding estimate was made. And such estimates of the amount and quantity shall not be required to be made by strict measurement, or with exactness, but they may, at the option of the Engineer, be approximate only. And upon such estimate being made the Commission will pay to the Contractors eighty (80) per cent. of such estimated value.

18. The Contractors shall deliver to the Engineer for extra work, not covered by an established price, as mentioned in clauses 6 and 7 of the specifications hereunto attached, signed by themselves or agent on or before the third day of the month following that in which said extra work was done, and such accounts will be paid in full within five weeks upon the Engineer's certificate for their correctness, and no claim whatever will be considered for works not so included in such account. Such payments on extra work shall not be construed, however, as an acceptance of any such work, and shall not lessen the liability of the Contractors to replace defective work, though the conditions of the same may not have been known to the Engineer at the time his certificate was given or acted upon.

19. The Contractors hereby further agree to make all the needed repairs in the said work during a period of nine (9) months after its final completion; and they hereby further agree that the Commission is authorized to retain out of the monies payable or to become payable to them, under this agreement, the sum of five (5) per cent. on the amount of the contract, and to expend the same or so much thereof as may be required, in making the aforesaid repairs to the satisfaction of the Engineer, if after the delivery or mailing of a notice in writing to the Contractors or their agent, they shall neglect to make the aforesaid needed repairs within the time specified in such notice; and they (the Contractors) hereby further agree to be responsible for any accident that may occur on account of the defective condition of the work.

20. It is further mutually agreed that whenever this contract, in the opinion of the Engineer, shall be completely performed on the part of the Contractors, the Engineer shall proceed, with all reasonable diligence, to measure up the work, if need be, and shall make out the final estimate for the same, and shall certify the same; and upon the expiration of sixty (60) days after the acceptance by the Commission of the work herein agreed to be done by the Contractors, the said Commission will pay to the said Contractors the amount remaining, after deducting from the amount or value named in the last mentioned (final) certificate, all such sums as shall previously have been paid to the said Contractors under any of the provisions of the contract, and also such sums of money as by the terms they are authorized to reserve or retain, provided that nothing herein contained shall be construed to affect the right hereby reserved by the said Commission to reject the whole or any portion of the aforesaid work should the said certificate be found or known to be inconsistent with the terms of this agreement, or otherwise improperly given.

21. And it is hereby agreed that the said Contractors shall indemnify and save harmless the Commission from and against all claims against the said Commission for all labor done and materials furnished under this contract, and shall furnish said Commission with satisfactory evidence, when requested, that all persons who have done work or furnished materials under this contract, for which the Commission might become liable, have been fully paid or satisfactorily secured; and in case such evidence is not furnished an amount necessary and sufficient to meet the claims of persons aforesaid shall be retained from money due the said Contractors under this contract, until the liabilities aforesaid shall be fully discharged or satisfactorily secured.

22. And the Contractors agree that they will indemnify and save harmless the said Commission from all suits or actions of every name and description brought against the said Commission, for or on account of any damages received or sustained by any party or parties, by or from the said Contractors, their servants or agents, in the construction of the said works, or by or in consequence of any negligence in guarding the same, or any improper materials furnished by the Contractor, used in its construction, or by or on account of any act or omission of the said Contractors, and that the Contractors will faithfully perform this contract according to the true intent and meaning thereof; and the said Contractors hereby further agree that so much of the money due to them under and by virtue of this agreement as shall be considered necessary by the said Commission may be retained by the said Commission until all such suits or claims for damages, as aforesaid, shall have been settled and evidence to that effect furnished to the satisfaction of the said Commission.

23. And the Contractors further agree that they will execute and deliver to the said Commission a bond by an approved Surety Company, in the sum of Eleven thousand ($11,000.00) dollars providing for the carrying out of the work according to this contract and the specifications hereunto attached.

24. This agreement shall enure to the benefit of and be binding upon the successors and assigns of the Commission and the heirs, executors, administrators and assigns of the said Contractors, as well as upon the Commission and Contractors.

IN WITNESS THEREOF the parties to these presents have hereunto set their hands and seals, the day and year herein first written.

SIGNED, SEALED AND DELIVERED
In the presence of

QUEEN VICTORIA NIAGARA FALLS PARK COMMISSIONERS.

J. W. Langmuir,
Chairman.
[Seal.]

B. A. Cook.
E. H. Menzie.
[Seal.]

John H. Jackson.

The Commissioners for the Queen Victoria Niagara Falls Park, acting in pursuance of Section 49 of the Ontario Public Works Act, hereby accept the above written contract with the parties therein named of the second part, and all the provisions thereof, as well on behalf of them, the said Commissioners in their Corporate capacity, and also in the name and on behalf of his Majesty the King, and in witness whereof the Chairman, as duly authorized, has affixed the Corporate Seal and his own signature on the day and year first above written.

J. W. Langmuir,
Chairman.

APPENDIX "L"

Contract for the Construction of the Niagara River Boulevard.

Section 1B—Chippawa.

THIS AGREEMENT, made (in triplicate) this 23rd day of November, A.D. 1910,

BY AND BETWEEN The Queen Victoria Niagara Falls Park Commission, of the first part, and

H. Campaigne, Wm. Ward, John Ward, Wm. Upper, and Chas. Lobb, trading under the firm name of H. A. Campaigne & Co., of the second part.

WITNESSETH:

1. That the said party of the first part has let and awarded to the Contractor, and in consideration of the covenants and agreements herein contained on the part of the Contractor to be kept and performed by him, does hereby let and award to the said Contractor the following described work or contract, upon the following terms and conditions and specifications, hereunto annexed, and in accordance with the plans hereof, on file in the Office of the Commission at Niagara Falls, all of which form a part of this contract.

2. The work to be done and the materials to be furnished under this contract are described as being the construction of Section 1B, Chippawa, of the Niagara River Boulevard from the end of Section 1A at Station 46+36 to constructed roadway, Section 1, at Station 89+65.

3. And the said Contractor, in consideration of the letting and awarding to him of the said contract and work, and in consideration of the payments hereinafter mentioned, to be made to him by the said Commission, and under the penalty expressed in a Bond bearing even date with the presents and hereunto annexed, hereby agrees at his own proper cost and expense to do all the work, furnish all materials above set forth, according to the true intent and meaning of the specifications and conditions herein contained.

4. And does further agree that the said Commission shall be and are authorized to appoint an Engineer of the said Boulevard, and such assistants and inspectors as they may deem proper to inspect the work to be done under this agreement, and to see that the same strictly corresponds with the specifications hereunto annexed.

5. To prevent all disputes and litigation, it is further agreed by and between the parties to this contract that the Engineer of the said Boulevard shall in all cases determine the amounts or quality of work to be done, and which are to be paid for under this contract or in connection with said Boulevard construction, and he shall decide all questions which may arise relative to the execution of the contract or to said construction on the part of the Contractor, and his estimates, directions and decisions shall be final and conclusive, and binding upon the said Contractor.

6. It is understood that whatever conditions and specifications are mentioned herein, the conditions and specifications hereunto annexed are referred to, and the same are to be taken as a part of this contract and construed therewith.

7. And it is further agreed that this contract shall be executed in triplicate, one of which triplicates shall be kept by the said Commission, one to be kept by the said Engineer, and one to be delivered to the Contractor.

8. And the said Contractor hereby agrees to receive the following lump sum and prices as full compensation for the use of forms, tools, patterns, plant, imple-

ments, and machinery, including all transportation, etc., for the same, and for all the labor for executing all the work contemplated in this contract; for all bailing, draining and pumping of water; for all loss or damage arising out of the aforesaid work, or from the action of the elements, or from any unforeseen destruction or difficulties which may be encountered in the prosecution of the same, and for all risk of every description connected with the work, also for all expenses incurred by or in consequence of the suspension or discontinuance of the said works (in case the Engineer should so direct), and for the providing of such labor as the Engineer may require from time to time to assist him in the staking and laying out of the work, and for well and faithfully completing the work and the whole thereof in the manner and according to the plans and specifications and the requirements of the Engineer under them; it being distinctly undersood that there shall be no claim for any extra work except as herein specially provided for; also the furnishing (including transportation) of all the materials necessary for the full completion of the work, and the keeping of the works in repair and in good working order, until the final payments are made, the whole work to be completed according to the plans and specifications for the lump sum price of Eight thousand and fifty ($8,050.00) dollars; and further agrees to any combination of the following additions and deductions per item, to or from the work shown on plans and described generally in clause 2 of this contract, and specifically in the specifications hereunto attached, namely:

The additions or deductions of:—

(a). Pipe Culverts (concrete tile furnished by the Commission) as per specifications, with the exception of extra head walls at outlet ends, as follows:—

8	inch,	per lineal foot	30c
12	"	"	35c
15	"	"	45c
18	"	"	55c
24	"	"	70c

(b). Extra head walls at outlet ends of extra pipe culverts, $7.50.

(c). Construction of three (3) foot by two (2) foot, six (6) inch reinforced concrete Box Culverts complete, as per specifications, as follows:

Single Box,	per lineal foot	$2.50
Twin "	"	4.50

(d). Construction of Catch Basins complete, as per specifications, each, $6.00.

(e). Furnishing and laying four (4) inch Tile Drain as per Clause 24, ten (10) cents per lineal foot.

(f). Macadam roadway complete, as per Clause 25 of specifications, including rolling of subgrade, construction of shoulders and side ditches, per square yard of macadam surface, $1.25.

(g). Two-course macadam roadway, as per Clause 27, Section "C" of specifications, including rolling of subgrade, construction of shoulders and side ditches, per square yard of macadam surface, $1.00.

(h). Retaining Wall complete, as per specifications, per lineal foot, $2.50.

(i). Concrete Arch Culvert Extension, per lineal foot, $6.50.

9. The work embraced in this contract shall be begun within three (3) days after notice so to do shall have been given to the Contractor by the Engineer, and carried on regularly and uninterruptedly thereafter with such a force as to secure its full completion on or before the 1st July, 1911, and such portions thereof shall be completed in each month as the Engineer shall determine is a fair proportion thereof.

10. And the said party of the second part further agrees that the said party of the first part shall be and is hereby authorized to deduct and retain out of the monies which may be due or become due to the said party of the second part under this agreement as damages for the non-completion of the work aforesaid within the time hereinbefore stipulated for its completion, or within such further time as, in accordance with the provisions of this agreement, shall be fixed or allowed for such performance or completion, the sum of One hundred ($100.00) dollars per day for each and every day the time employed upon the said work may exceed the time stipulated for its completion, or such stipulated time as the same may be increased as hereinbefore provided, which said sum of One hundred ($100.00) dollars per day is hereby, in view of the difficulty of estimating such damages agreed upon, fixed and determined by the parties hereto as the liquidated damages that the party of the first part will suffer by reason of such default and not by way of penalty.

11. The party of the first part reserves the right of suspending the whole or any part of the work herein contracted to be done if it is deemed to be for the best interest of the Commission so to do without compensation to the Contractor for such suspension other than extending the time for completing the work as long a time as it may have been delayed by such suspension.

12. No charge shall be made by the Contractor for hindrance or delay from any cause during the progress of the work embraced in this contract.

13. The said Contractor further agrees that he will give personal attention constantly to the faithful prosecution of the work, and will not assign or sub-let the work or any part thereof or any of the monies or orders payable under the contract without the previous written consent of the Commission, but will keep the same under his personal control; that no right under this contract nor to any orders or monies due or to become due hereunder shall be asserted against the said commission or any members or officers thereof, by reason of any so-called assignment in law or equity of this contract or any part thereof, or of any monies or orders payable thereunder unless such assignments shall have been authorized by the written consent of the Commission; that no person other than the party signing this agreement as the Contractor hereby now have any claim hereunder; that no claim shall be made except under a specific clause of this agreement by any person whatever.

14. In the event of the Contractor failing or neglecting for one (1) month to pay the wages of the men and teams employed on the works, the Commission, on the representation of the Engineer, reserve to themselves the right to pay all such wages ascertained to be due and to deduct the amount of the same from any monies due or coming due to the Contractor upon this or any other contract.

15. It shall be lawful for the said Commission in case the said Contractor shall fail in the due performance of any part of his undertaking or shall become bankrupt or insolvent or shall compound with his creditors or propose any composition with his creditors for the settlement of his debts, or shall carry on or propose to carry on his business under inspectors on behalf of his creditors, or shall commit any act of bankruptcy, to re-let the undertaking of said contract or any part thereof, and upon such condition as it may think fit, or from time to time may engage workmen and provide all such materials, implements and apparatus, and employ the same in such manner as the said Engineer may think necessary and proper for completing the said works or any part of them, and any loss, damage or deficiency that may arise in consequence of said bankruptcy or failure on part of the Contractor shall be paid and deducted out of the money retained by said Commission out of any work previously performed by said Contractor, and should said money

so retained be not sufficient to indemnify and cover such losses, the deficiency then due shall be a charge on the Bond accompanying this instrument.

16. If the said Contractor is not, in the opinion of the Engineer, proceeding with the work expeditiously, continuously and in accordance with the terms of this contract, and to the satisfaction of the said Engineer, and so as to ensure, in his opinion, a satisfactory completion and delivery to the Commission by the date herein provided, and should the Engineer so certify to the Commission in writing, the said Commission shall thereupon require the said Contractor to proceed without delay with such force as may be directed, and in case of his refusal or neglect to completely comply with such requirement within three (3) days after being notified so to do, the said Commission may take possession of and complete said work at the expense of said Contractor as herein provided in case of failure or insolvency.

17. In order to enable the Contractor to prosecute the work advantageously, the Engineer shall on or about the last Saturday of each month make an estimate in writing of the amount of work done and materials delivered to be used in the work and of the value thereof according to the terms of this contract. The first such estimate shall be of the amount or quantity and value of the work done and materials delivered since the Contractor commenced the performance of this contract on his part. And every subsequent estimate, except the final one, shall be of the amount or quantity and value of the work done since the last preceding estimate was made. And such estimates of the amount and quantity shall not be required to be made by strict measurement, or with exactness, but they may, at the option of the Engineer, be approximate only. And upon such estimate being made the Commission will pay to the Contractor eighty (80) per cent. of such estimated value.

18. The Contractor shall deliver to the Engineer for extra work, not covered by an established price, as mentioned in clauses 6 and 7 of the specifications hereunto attached, signed by themselves or agent on or before the third day of the month following that in which said extra work was done, and such accounts will be paid in full within five weeks upon the Engineer's certificate for their correctness, and no claim whatever will be considered for works not so included in such account. Such payments on extra work shall not be construed, however, as an acceptance of any such work, and shall not lessen the liability of the Contractor to replace defective work, though the conditions of the same may not have been known to the Engineer at the time his certificate was given or acted upon.

19. The Contractor hereby further agrees to make all the needed repairs in the said work during a period of nine (9) months after its final completion; and he hereby further agrees that the Commission is authorized to retain out of the monies payable or to become payable to him, under this agreement, the sum of five (5) per cent. on the amount of the contract, and to expend the same or so much thereof as may be required, in making the aforesaid repairs to the satisfaction of the Engineer, if after the delivery or mailing of a notice in writing to the Contractor or his agent, he shall neglect to make the aforesaid needed repairs within the time specified in such notice; and he (the Contractor) hereby further agrees to be responsible for any accident that may occur on account of the defective condition of the work.

20. It is further mutually agreed that whenever this contract, in the opinion of the Engineer, shall be completely performed on the part of the Contractor, the Engineer shall proceed, with all reasonable diligence, to measure up the work, if need be, and shall make out the final estimate for the same, and shall certify the same; and upon the expiration of sixty (60) days after the acceptance by the Commission of the work herein agreed to be done by the Contractor, the said Commis-

sion will pay to the said Contractor the amount remaining, after deducting from the amount or value named in the last mentioned (final) certificate, all such sums as shall previously have been paid to the said Contractor under any of the provisions of the contract, and also such sums of money as by the terms they are authorized to reserve or retain, provided that nothing herein contained shall be construed to affect the right hereby reserved by the said Commission to reject the whole or any portion of the aforesaid work should the said certificate be found or known to be inconsistent with the terms of this agreement, or otherwise improperly given.

21. And it is hereby agreed that the said Contractor shall indemnify and save harmless the Commission from and against all claims against the said Commission for all labor done and materials furnished under this contract, and shall furnish said Commission with satisfactory evidence, when requested, that all persons who have done work or furnished materials under this contract, for which the Commission might become liable, have been fully paid or satisfactorily secured; and in case such evidence is not furnished an amount necessary and sufficient to meet the claims of persons aforesaid shall be retained from money due the said Contractor under this contract, until the liabilities aforesaid shall be fully discharged or satisfactorily secured.

22. And the Contractor agrees that he will indemnify and save harmless the said Commission from all suits or actions of every name and description brought against the said Commission, for or on account of any damages received or sustained by any party or parties, by or from the said Contractor, his servants or agents, in the construction of the said works, or by or in consequence of any negligence in guarding the same, or any improper materials furnished by the Contractor, used in its construction, or by or on account of any act or omission of the said Contractor, and that the Contractor will faithfully perform this contract according to the true intent and meaning thereof; and the said Contractor hereby further agrees that so much of the money due to him under and by virtue of this agreement as shall be considered necessary by the said Commission may be retained by the said Commission until all such suits or claims for damages, as aforesaid, shall have been settled and evidence to that effect furnished to the satisfaction of the said Commission.

23. And the Contractor further agrees that he will execute and deliver to the said Commission a Bond by an approved Surety Company, in the sum of Three thousand ($3,000.00) dollars providing for the carrying out of the work according to this contract and the specifications hereunto attached.

24. This agreement shall enure to the benefit of and be binding upon the successors and assigns of the Commission and the heirs, executors, administrators and assigns of the said Contractor as well as upon the Commission and Contractor.

IN WITNESS THEREOF, the parties to these presents have hereupon set their hands and seals, the day and year herein first written.

SIGNED, SEALED AND DELIVERED:
In the presence of

QUEEN VICTORIA NIAGARA FALLS PARK COMMISSIONERS.

J. W. Langmuir,
Chairman.

H. A. Campaigne & Co.,
Per H. A. Campaigne.

Wm. Upper.

C. G. Lobb.

Wm. Ward.

J. Ward.

Jean Waid.
James J. O'Rourke.
James J. O'Rourke.
James J. O'Rourke.

The Commissioners for the Queen Victoria Niagara Falls Park, acting in pursuance of Section 49 of the Ontario Public Works Act, hereby accept the above written contract with the parties therein named of the second part, and all the provisions thereof, as well on behalf of them the said Commissioners in their Corporate capacity and also in the name and on behalf of His Majesty the King, and in witness whereof the Chairman, as duly authorized, has affixed the Corporate Seal and his own signature on the day and year first above written.

J. W. Langmuir,
Chairman.

APPENDIX "M"

Contract for the Construction of the Niagara River Boulevard.

Section No. 4A—Cozy Dell.

THIS AGREEMENT, made (in triplicate) this 25th day of November, A.D. 1910,

BY AND BETWEEN The Queen Victoria Niagara Falls Park Commission, of the first part, and

The Power City Stone Company, Limited, of the second part.

WITNESSETH:

1. That the said party of the first part has let and awarded to the Contractor, and in consideration of the covenants and agreements herein contained on the part of the Contractor to be kept and performed by him, does hereby let and award to the said Contractor the following described work or contract, upon the following terms and conditions and specifications, hereunto annexed, and in accordance with the plans thereof, on file in the Office of the Commission at Niagara Falls, all of which form a part of this contract.

2. The work to be done and the materials to be furnished under this contract are described as being the construction of Section No. 4A, Cozy Dell, Niagara River Boulevard, a distance of 1,637 lineal feet.

3. And the said Contractor, in consideration of the letting and awarding to him of the said contract and work, and in consideration of the payments hereinafter mentioned, to be made to him by the said Commission, and under the penalty expressed in a Bond bearing even date with the presents and hereunto annexed, hereby agrees at his own proper cost and expense to do all the work, furnish all materials above set forth, according to the true intent and meaning of the specifications and conditions herein contained.

4. And does further agree that the said Commission shall be and are authorized to appoint an Engineer of the said Boulevard, and such assistants and inspectors as they may deem proper to inspect the work to be done under this agreement, and to see that the same strictly corresponds with the specifications hereunto annexed.

5. To prevent all disputes and litigation, it is further agreed by and between the parties to this contract that the Engineer of the said Boulevard shall in all cases determine the amounts or quality of work to be done, and which are to be paid for under this contract or in connection with said Boulevard construction, and he shall decide all questions which may arise relative to the execution of the contract or to said construction on the part of the Contractor, and his estimates, directions and decisions shall be final and conclusive, and binding upon the said Contractor.

6. It is understood that whatever conditions and specifications are mentioned herein, the conditions and specifications hereunto annexed are referred to, and the same are to be taken as a part of this contract and construed therewith.

7. And it is further agreed that this contract shall be executed in triplicate, one of which triplicates shall be kept by the said Commission, one to be kept by the said Engineer, and one to be delivered to the Contractor.

8. And the said Contractor hereby agrees to receive the following lump sum and prices as full compensation for the use of forms, tools, patterns, plant, implements, and machinery, including all transportation, etc., for the same, and for all the labor for executing all the work contemplated in this contract; for all bailing, draining and pumping of water; for all loss or damage arising out of the aforesaid work, or from the action of the elements, or from any unforeseen destruction or difficulties which may be encountered in the prosecution of the work, also for all expenses incurred by or in consequence of the suspension or discontinuance of the said works (in case the Engineer should so direct), and for the providing of such labor as the Engineer may require from time to time to assist him in the staking and laying out of the work, and for well and faithfully completing the work and the whole thereof in the manner and according to the plans and specifications and the requirements of the Engineer under them; it being distinctly undersood that there shall be no claim for any extra work except as herein specially provided for; also the furnishing (including transportation) of all the materials necessary for the full completion of the work, and the keeping of the works in repair and in good working order, until the final payments are made, the whole work to be completed according to the plans and specifications for the lump sum price of $6,947.15, and further agrees to any combination of the following additions and deductions per item, to or from the work shown on plans and described generally in Clause 2 of this contract; and specially in the specifications hereunto attached, namely:

The addition or deduction of:

(a). Pipe Culverts (concrete tile furnished by the Commission) as per specifications, with the exception of extra head walls at outlet ends, as follows:—

8	inch,	per lineal foot	30c
12	"	"	35c
15	"	"	45c
18	"	"	55c
24	"	"	70c

(b). Extra head walls at outlet ends of extra pipe culverts, $7.50.

(c). Construction of three (3) foot by two (2) foot, six (6) inch reinforced concrete Box Culverts complete, as per specifications, as follows:

Single Box,	per	lineal foot	$2.50
Twin	"	"	4.50

(d). Construction of Catch Basins complete, as per specifications, each, $6.00.

(e). Furnishing and laying four (4) inch Tile Drain as per Clause 24, ten (10) cents per lineal foot.

(f). Macadam roadway complete, as per Clause 25 of specifications, including rolling of subgrade, construction of shoulders and side ditches, per square yard of macadam surface, $1.25.

(g). Two-course macadam roadway, as per Clause 27, Section "C" of specifications, including rolling of subgrade, construction of shoulders and side ditches, per square yard of macadam surface, $1.00.

(h). Retaining Wall complete, as per specifications, per lineal foot, $2.50.

(i). Concrete Arch Culvert Extension, per lineal foot, $2.25.

9. The work embraced in this contract shall be begun within three (3) days after notice so to do shall have been given to the Contractor by the Engineer, and carried on regularly and uninterruptedly thereafter with such a force as to secure its full completion on or before the 1st day of July, 1911, and such portions thereof shall be completed in each month as the Engineer shall determine is a fair proportion thereof.

10. And the said party of the second part further agrees that the said party of the first part shall be and is hereby authorized to deduct and retain out of the monies which may be due or become due to the said party of the second part under this agreement as damages for the non-completion of the work aforesaid within the time hereinbefore stipulated for its completion, or within such further time as, in accordance with the provisions of this agreement, shall be fixed or allowed for such performance or completion, the sum of One hundred ($100.00) dollars per day for each and every day the time employed upon the said work may exceed the time stipulated for its completion, or such stipulated time as the same may be increased as hereinbefore provided, which said sum of One hundred ($100.00) dollars per day is hereby, in view of the difficulty in estimating such damages agreed upon, fixed and determined by the parties hereto as the liquidated damages that the party of the first part will suffer by reason of such default and not by way of penalty.

11. The party of the first part reserves the right of suspending the whole or any part of the work herein contracted to be done if it is deemed to be for the best interest of the Commission so to do without compensation to the Contractor for such suspension other than extending the time for completing the work as long a time as it may have been delayed by such suspension.

12. No charge shall be made by the Contractor for hindrance or delay from any cause during the progress of the work embraced in this contract.

13. The said Contractor further agrees that he will give personal attention constantly to the faithful prosecution of the work, and will not assign or sub-let the work or any part thereof or any of the monies or orders payable under the contract without the previous written consent of the Commission, but will keep the same under his personal control; that no right under this contract nor to any orders or monies due or to become due hereunder shall be asserted against the said Commission or any members or officers thereof, by reason of any so-called assignment in law or equity of this contract or any part thereof, or of any monies or orders payable thereunder, unless such assignments shall have been authorized by the written consent of the Commission; that no person other than the party signing this agreement as the Contractor hereby now have any claim hereunder; that no claim shall be made except under a specific clause of this agreement by any person whatever.

14. In the event of the Contractor failing or neglecting for one (1) month to pay the wages of the men and teams employed on the works, the Commission, on the representation of the Engineer, reserve to themselves the right to pay all such wages ascertained to be due and to deduct the amount of the same from any monies due or coming due to the Contractor upon this or any other contract.

15. It shall be lawful for the said Commission in case the said Contractor shall fail in the due performance of any part of his undertaking or shall become bankrupt or insolvent or shall compound with his creditors or propose any composition with his creditors for the settlement of his debts, or shall carry on or propose to carry on his business under inspectors on behalf of his creditors, or shall commit

any act of bankruptcy, to re-let the undertaking of said contract or any part thereof, and upon such condition as it may think fit, or from time to time may engage workmen and provide all such materials, implements and apparatus, and employ the same in such manner as the said Engineer may think necessary and proper for completing the said works or any part of them, and any loss, damage or deficiency that may arise in consequence of said bankruptcy or failure on part of the Contractor shall be paid and deducted out of the money retained by said Commission out of any work previously performed by said Contractor, and should said money so retained be not sufficient to indemnify and cover such losses, the deficiency then due shall be a charge on the Bond accompanying this instrument.

16. If the said Contractor is not, in the opinion of the Engineer, proceeding with the work expeditiously, continuously and in accordance with the terms of this contract, and to the satisfaction of the said Engineer, and so as to ensure, in his opinion, a satisfactory completion and delivery to the Commission by the date herein provided, and should the Engineer so certify to the Commission in writing, the said Commission shall thereupon require the said Contractor to proceed without delay with such force as may be directed, and in case of his refusal or neglect to completely comply with such requirement within three (3) days after being notified so to do, the said Commission may take possession of and complete said work at the expense of said Contractor as herein provided in case of failure or insolvency.

17. In order to enable the Contractor to prosecute the work advantageously, the Engineer shall on or about the last Saturday of each month make an estimate in writing of the amount of work done and materials delivered to be used in the work and of the value thereof according to the terms of this contract. The first such estimate shall be of the amount or quantity and value of the work done and materials delivered since the Contractor commenced the performance of this contract on his part. And every subsequent estimate, except the final one, shall be of the amount or quantity and value of the work done since the last preceding estimate was made. And such estimates of the amount and quantity shall not be required to be made by strict measurement, or with exactness, but they may, at the option of the Engineer, be approximate only. And upon such estimate being made the Commission will pay to the Contractor eighty (80) per cent. of such estimated value.

18. The Contractor shall deliver to the Engineer for extra work, not covered by an established price, as mentioned in clauses 6 and 7 of the specifications hereunto attached, signed by themselves or agent on or before the third day of the month following that in which said extra work was done, and such accounts will be paid in full within five weeks upon the Engineer's certificate for their correctness, and no claim whatever will be considered for works not so included in such account. Such payments on extra work shall not be construed, however, as an acceptance of any such work, and shall not lessen the liability of the Contractor to replace defective work, though the conditions of the same may not have been known to the Engineer at the time his certificate was given or acted upon.

19. The Contractor hereby further agrees to make all the needed repairs in the said work during a period of nine (9) months after its final completion; and he hereby further agrees that the Commission is authorized to retain out of the monies payable or to become payable to him, under this agreement, the sum of five (5) per cent. on the amount of the contract, and to expend the same or so much thereof as may be required, in making the aforesaid repairs to the satisfaction of the Engineer, if after the delivery or mailing of a notice in writing to the Contractors or his agent, they shall neglect to make the aforesaid needed repairs within the time specified in such notice; and he (the Contractor) hereby further agrees

to be responsible for any accident that may occur on account of the defective condition of the work.

20. It is further mutually agreed that whenever this contract, in the opinion of the Engineer, shall be completely performed on the part of the Contractor, the Engineer shall proceed, with all reasonable diligence, to measure up the work, if need be, and shall make out the final estimate for the same, and shall certify the same; and upon the expiration of sixty (60) days after the acceptance by the Commission of the work herein agreed to be done by the Contractor, the said Commission will pay to the said Contractor the amount remaining after deducting from the amount or value named in the last mentioned (final) certificate, all such sums as shall previously have been paid to the said Contractor under any of the provisions of the contract, and also such sums of money as by the terms they are authorized to reserve or retain, provided that nothing herein contained shall be construed to affect the right hereby reserved by the said Commission to reject the whole or any portion of the aforesaid work should the said certificate be found or known to be inconsistent with the terms of this agreement, or otherwise improperly given.

21. And it is hereby agreed that the said Contractor shall indemnify and save harmless the Commission from and against all claims against the said Commission for all labor done and materials furnished under this contract, and shall furnish said Commission with satisfactory evidence, when requested, that all persons who have done work or furnished materials under this contract, for which the Commission might become liable, have been fully paid or satisfactorily secured; and in case such evidence is not furnished an amount necessary and sufficient to meet the claims of persons aforesaid shall be retained from money due the said Contractor under this contract, until the liabilities aforesaid shall be fully discharged or satisfactorily secured.

22. And the Contractor agrees that he will indemnify and save harmless the said Commission from all suits or actions of every name and description brought against the said Commission, for or on account of any damages received or sustained by any party or parties, by or from the said Contractor, his servants or agents, in the construction of the said works, or by or in consequence of any negligence in guarding the same, or any improper materials furnished by the Contractor, used in its construction, or by or on account of any act or omission of the said Contractor, and that the Contractor will faithfully perform this contract according to the true intent and meaning thereof; and the said Contractor hereby further agrees that so much of the money due to him under and by virtue of this agreement as shall be considered necessary by the said Commission may be retained by the said Commission until all such suits or claims for damages, as aforesaid, shall have been settled and evidence to that effect furnished to the satisfaction of the said Commission.

23. And the Contractor further agrees that he will execute and deliver to the said Commission a Bond by an approved Surety Company in the sum of dollars providing for the carrying out of the work according to this contract and the specifications hereunto attached.

24. This agreement shall enure to the benefit of and be binding upon the successors and assigns of the Commission and the heirs, executors, administrators and assigns of the said Contractor, as well as upon the Commission and Contractor.

IN WITNESS THEREOF, the parties to these presents have hereunto set their hands and seals, the day and year herein first written.

SIGNED, SEALED AND DELIVERED:
In the presence of

QUEEN VICTORIA NIAGARA FALLS PARK COMMISSIONERS.
J. W. LANGMUIR,
Chairman.

THE POWER CITY STONE CO., LTD.,
J. H. SYMMES, President.
ROBIN BOYLE, Secretary.
[Seal]

JEAN WAID.
J. H. BARBEAU.

The Commissioners for the Queen Victoria Niagara Falls Park, acting in pursuance of Section 49 of the Ontario Public Works Act, hereby accept the above written contract with the parties therein named of the second part, and all the provisions thereof, as well on behalf of them the said Commissioners in their Corporate capacity and also in the name and on behalf of His Majesty the King, and in witness whereof the Chairman, as duly authorized, has affixed the Corporate Seal and his own signature on the day and year first above written.

J. W. LANGMUIR,
Chairman.

APPENDIX "C"

ONTARIO EXECUTIVE COUNCIL OFFICE.

Copy of the Order-in-Council approved by His Honour the Lieutenant Governor, the 23rd day of November, A.D., 1910.

Referring to the Order-in-Council of the 6th day of March, 1903, approving of a certain agreement known as the Pipe Line and Power House Agreement made between the Commissioners of the Queen Victoria Niagara Falls Park of the first part, and the Ontario Power Company of Niagara Falls of the second part, respecting the construction of works and the exercise of powers within Queen Victoria Niagara Falls Park, and upon the recommendation of the Honourable the Attorney-General, the Committee of Council advise that the accompanying agreement between the above named parties, dated the 18th day of November, 1910, approving of the location of the overflow or regulating devices for pipes numbers two and three and of the design of the overflow or regulating device for pipe number two be approved by Your Honour.

Certified,
M. CURREY,
Assistant Clerk, Executive Council.

APPENDIX "D"

At a meeting of the Board of Directors of the Ontario Power Company of Niagara Falls, held at Buffalo, New York, on the twenty-first day of November, 1910, the proposed Agreement *re* Overflows numbers two and three between the Commissioners of Queen Victoria Niagara Falls Park and The Ontario Power

Company of Niagara Falls was produced and read and on motion, duly seconded, it was unanimously

RESOLVED, that the said Agreement *re* Overflows numbers two and three between the Commissioners of Queen Victoria Niagara Falls Park, acting therein in their own behalf and with the approval of the Government of the Province of Ontario, and the Ontario Power Company of Niagara Falls, submitted to this meeting, be and the same is hereby approved and adopted, and Francis V. Greene, the Vice-President, and Robert C. Board, the Secretary of the Company, be and they are hereby authorized and directed to execute the same on behalf of this Company, in triplicate, by affixing the corporate seal of this Company thereto and by signing the same as such Vice-President and Secretary.

And that when so executed said officers are authorized, empowered and directed to make delivery thereof as the act and deed of this Company and that the said Agreement be entered in full on the minutes of this meeting, which is accordingly done below.

I, Robert C. Board, Secretary of The Ontario Power Company of Niagara Falls, hereby certify that the foregoing resolution is a true copy of the resolution passed at a meeting of the Board of Directors of the said Company, in the City of Buffalo, this twenty-first day of November, 1910.

ROBERT C. BOARD.

APPENDIX "E"

THIS AGREEMENT made the 18th day of November, one thousand nine hundred and ten.

BETWEEN the Commissioners of the Queen Victoria Niagara Falls Park, acting herein on their own behalf and with the approval of the Government of the Province of Ontario, and hereinafter called the Commissioners, of the first part, and

The Ontario Power Company of Niagara Falls, incorporated by the Parliament of Canada, and hereinafter called the "Company," of the second part.

WHEREAS the Company is authorized by Chapter 120 of the Statutes of Canada, of 1887, and other Statutes of the Company, by means of utilizing the natural supply of the Niagara and Welland Rivers with the object of promoting manufacturing industries and inducing the establishment of manufactories in Canada, and other businesses, to construct all such works, dams and wing dams, docks, conduits, accessories and buildings as may be necessary to give full intent to such powers and by means of and through the works aforesaid to supply manufacturers, corporations and persons with water, hydraulic, electric or other power for use in manufacturing or any other business or purpose; and so that none of the works authorized by the above recited Statutes of Canada relating to the Company, shall be constructed within the limits of the Queen Victoria Niagara Falls Park; and so that none of the powers given by said Statutes or any of them, shall be exercised within the limits of said Park, except with the consent of the Lieutenant-Governor of Ontario in Council and of the Commissioners of the said Park.

AND WHEREAS by section 36 of chapter 11 of the Statutes of Ontario, 1899, to amend the Statute Law, it is enacted: The Commissioners of the Queen Victoria Niagara Falls Park, "with the approval of the Lieutenant-Governor in Council may enter into an agreement or agreements with any person or persons, company or companies, to take water from the Niagara River or from the Niagara and Welland Rivers at certain points within or without the said Park for the

purpose of enabling such person or persons, company or companies, to generate within or without the Park electricity or pneumatic, hydraulic or other power, conducting or discharging said water through and across the said Park or otherwise, in such manner, for such rental and upon such terms and conditions as may be embodied in the agreement or agreements, and as may appear to the Lieutenant-Governor in Council to be in the public interest."

AND WHEREAS at the time of the sealing of these presents, there are existing four several agreements made by and between the several parties hereto and of the dates following:

(1) On the 11th April, 1900, the First Agreement.

(2) On the 15th August, 1901, the Supplementary Agreement,

(3) On the 28th June, 1902, the Complementary Agreement.

(4) On the 28th February, 1903, the Pipe Line and Power House Agreement.

all of which agreements have been made with the approval of the Lieutenant-Governor in Council in pursuance and in accordance with the above recited Ontario Statutes of 1899, and with the approval of the Commissioners as testified by being parties thereto;

AND WHEREAS under the said Pipe Line and Power House agreement the Company was authorized to construct the works therein specified for the consideration and on the terms and subject to the conditions, provisoes and agreements in said agreement contained.

AND WHEREAS among other things the Company desired to construct overflow or regulating devices for pipes numbers one, two and three mentioned in said agreement.

AND WHEREAS it is by the said Pipe Line and Power House agreement provided that before the Company commences to construct the overflow or regulating devices for pipes numbers two and three the location and design of said overflows for pipes numbers two and three shall be submitted to the Commissioners for their approval, and the construction thereof shall not be proceeded with until such approval is obtained.

AND WHEREAS the Company has applied to the Commissioners for their approval of the location and design of the overflow or regulating device for pipe number two and for the location of the overflow device for pipe number three, and has submitted to the Commissioners a plan showing the design and location of the overflow or regulating device for pipe number two and the location of the overflow device for pipe number three and the Commissioners have expressed their approval of said location and design of the overflow or regulating device for pipe number two and of the location of the overflow or regulating device for pipe number three.

NOW THEREFORE THIS AGREEMENT WITNESSETH that the Commissioners hereby approve, subject to the provisions hereinafter contained, of the location of the overflow or regulating device for pipe number two as and where it is shown on the plan marked "E" which plan is duly identified by the signature of O. B. Suhr, the Company's resident engineer, and by the signature of John H. Jackson, Superintendent of the Niagara Falls Park, and by the signature of The Ontario Power Company of Niagara Falls, per Francis V. Greene, Vice-President, and R. C. Board, Secretary, and the Commissioners of the Queen Victoria Niagara Falls Park, per J. W. Langmuir, Esquire, the Chairman, and is entitled, "The Ontario Power Company, Location of Overflows number two and number three," and the Commissioners hereby approve of the design of the overflow or

regulating device for pipe number two as shown on the plan marked "F" and identified in the same way as in Plan "E."

AND THIS AGREEMENT FURTHER WITNESSETH that the Commissioners hereby, subject to the provisions hereinafter contained, approve of the location of the overflow or regulating device for pipe number three as and where it is shown on the said plan marked "E," and the Company hereby waives and surrenders any right which it may have to insist on the said overflow or regulating device for pipes numbers two and three being located elsewhere in the said Park.

PROVIDED ALWAYS and it is hereby agreed between the parties that the Company shall at least three months before it proposes to commence the canstruction of the overflow or regulating device for pipe number three notify the Commissioners in writing of its intention to commence such construction, and if the Commissioners so desire they shall have the right at any time within sixty days after receipt of the said notice to withdraw the approval hereby given to the location of the overflow or regulating device for pipe number three and in lieu of the approval hereby given of the location of said overflow or regulating device by writing and by written notice to the Company in that behalf to approve of the location of the said overflow or regulating device on the site marked "alternate site for overflow number three" on said Plan "E," and upon the exercise of such right by the Commissioners the approval hereinbefore given shall be void and the Company shall after it has obtained the approval of the Commissioners to the design thereof construct the said overflow or regulating device on the said site so marked "alternate site for overflow number three."

PROVIDED that if the Commissioners do not within said sixty days after receipt by them of said notice from the Company by writing and by written notice to the Company in that behalf so withdraw such approval and approve of the location of the said overflow or regulating device on the site marked on said Plan "E" "alternate site for overflow number three" then the Company shall after it has obtained the approval of the Commissioners to the design thereof construct the said overflow or regulating device on the site now approved.

THIS AGREEMENT FURTHER WITNESSETH that in consideration of the Commissioners executing this agreement the Company hereby covenants and agrees to place and construct all the pipes to be connected with the said overflow and regulating devices for pipes numbers two and three so that all parts thereof shall be when completed at least five feet below the surface of the ground through which the same shall pass.

THE COMPANY agrees forthwith after the completion of the work to restore the surface of all portions of the Park which it may disturb in the execution of the works herein mentioned to the same grade and condition in which they now are and make good all damage, and to replace all structures, and to replant all trees and shrubs which it may cause injure or remove in the course of its operations, and that it will remove from the Park to some place to be designated by the Commissioners all surplus material and debris which it may bring or gather in the Park, and will interfere with the use of the Park by the public to as small an extent as possible.

PROVIDED that this clause shall not be construed to cancel, restrict or in any wise impair any covenants or agreements heretofore entered into by the Company with the Commissioners.

This agreement shall have no force or effect until approved by the Lieutenant-Governor in Council.

IN WITNESS WHEREOF the corporate seal of the Commissioners has been hereunto affixed by their Chairman, who has also signed these presents in certification of due execution hereof by the Commissioners, and the corporate seal of the Company has been hereunto affixed by the Vice-President, who has also signed these presents in certification of due execution hereof by the Company, and on the day and year first aforesaid.

THE ONTARIO POWER COMPANY OF NIAGARA FALLS,
by FRANCIS V. GREENE,
Vice-President.

ROBERT C. BOARD,
Secretary.

FRED. D. CORN,
Witness.

THE QUEEN VICTORIA NIAGARA FALLS PARK COMMISSION,
J. W. LANGMUIR,
Chairman.

JOHN H. JACKSON,
Witness.

APPENDIX "B."

REPORT OF THE CHIEF GARDENER.

To the Superintendent of the Queen Victoria Niagara Falls Park.

DEAR SIR,—I herewith present my Annual Report for the year ending December 31st, 1910, which comprises work of an essential nature done in the Horticultural Department of the Park System and referred to under the following headings:

THE PRUNING OF TREES AND SHRUBS.

During the winter of 1909-10, the necessary pruning and thinning of the trees and shrubs was undertaken. This occurred none too soon, as many beautiful deciduous trees and conifers were completely spoiled by the living and dead branches of other trees, and also of shrubs intermingling with their own, while in many cases climbing or trailing vines were directly responsible for the death or disfiguration of subjects which would otherwise have proved valuable assets to the Park.

The essential work of removing the dead and decayed branches and the thinning out of dense growth, especially where deciduous trees were concerned, has not been neglected during the past year, and although there is still much to be done, it is hoped that the desired end in this respect will soon be accomplished.

The cutting away and thinning out of the damaged and broken limbs of trees in proximity to the Falls is another matter which has received attention. In many cases trees which on account of the density of their limbs were unable to support the load of ice and snow, were judiciously thinned, much to the enhanced appearance of the surroundings.

In the southerly portion of the Park very little pruning has been done on account of the Ontario Power Company's excavations. The trees in this area will receive attention as soon as it is vacated by the Company, and the machinery removed therefrom.

It is highly gratifying to myself that the Park's Commission have encouraged the work of pruning the trees which have so long suffered through lack of this important operation. Wounds caused by the breaking down of branches have furnished access to fungus spores which on fructification were carried by the rain, wind, and similar agencies to other and probably better trees, the fungus gradually establishing itself, the result being a diseased condition of the host upon which it preyed.

Wherever wounds were created by the removal of limbs from trees and shrubs, their surfaces received special treatment and were covered with a coating of paint. Wounds so treated are not greatly affected by atmospheric conditions. Moisture, whether in the form of rain, snow, dew, or frost, is prevented from entering, and although fungus spores carried by these agencies and the wind, which is also a great disseminator, may be deposited upon the painted surface their death is inevitable, as they cannot find entry to the wound. By preventing the access of the agencies which convey the fungus spores, the tree is rendered immune from the attacks of fungi.

Troublesome Pests.

Apart from fungus diseases, the only pest which caused serious trouble was the Tussock Moth. This scourge will be difficult to keep under control until the City Councils and owners of trees realize that it is also to their best interests to assist in its eradication. The Elm Leaf Beetle (Galerucella luteola) has not been noticed on any of the elm trees in the Park, neither has the common elm saw-fly leaf miner of Europe (Kaliosphinga ulmi) although the latter is apparently on the increase at various places in New York State. The San Jose scale has been noticed on a few small mountain ashes, and also upon several varieties of apple trees which have evidently been allowed to remain as shade trees. Although this pest is very troublesome when established on a large scale, there is no cause for alarm as it usually preys upon rosaceous plants of an arboreal nature, of which there are comparatively few in the Park. Trees which for years have been badly affected were destroyed, while a spraying outfit has been obtained with which the scale can be effectually controlled. Examination of the Norway spruces in the Park revealed the fact that many were infested with the spruce Gall Louse (Chermes Abietes). These trees will receive attention at the proper season. In the immediate vicinity of the Park considerable damage has also been done, especially to the young spruces. In many cases the growth has been entirely arrested, the trees presenting a scraggy appearance as though scorched by fire.

The Classification of Trees and Shrubs.

During the past year a systematic attempt was made to name and classify the trees and shrubs in their natural orders in the Queen Victoria Park. For the purpose of naming the various subjects a sheet lead label five inches by three and one-quarter was used. The letters are stamped upon the surface of the lead by means of a steel die, thus causing depressions into which white lead is rubbed with a piece of cloth or sponge. The label is designed to contain the name of the

natural order, genus, species, or variety and also the natural habitat of the specimen to which it is attached, and being practically indestructible, rarely needs renewing.

Facilities for Education in Horticulture and Botany.

On account of the interest that is displayed by the public in the trees, shrubs, and flowering plants with which the Park System is well stocked, it would appear these are appreciated from a botanical as well as a horticultural standpoint, as they present an excellent opportunity for study. The systematic classification and naming of the subjects which grace our Park System is but little understood by the public generally, and the ever increasing number of enquiries regarding the name or characteristic of some plant, all tend to show that people, especially those who are cultured, desire to know something more about plants than is evident at a merely superficial glance.

As the natural environment of the Park, its railroad facilities, and its sources of revenue are unsurpassed, the establishment of a Provincial or National Botanic Garden along the lines of Kew with the object of collecting the flora indigenous to the country, and thus preserving species and varieties of plants which may otherwise become extinct, is to be commended. With the introduction also of useful and ornamental exotic subjects, Horticultural and Botanical Science would be materially benefitted.

The lack of a properly equipped range of greenhouses is to be deplored, as with this equipment the Park System would rank with the best on the Continent. The building of a lecture hall and library could be considered in due course, and eventually courses of lectures on the Geographical distribution of plants, systematic and economic botany, horticulture and allied subjects, such as soil physics and chemistry of plants could be given to the young men who would to some extent constitute the staff of the park. In this way it would be possible to train gardeners and others for positions at home and elsewhere. Apart from its attractiveness as a pleasure resort, the Park System would thus become of infinite value as a horticultural and botanical centre.

Respectfully submitted,

H. J. Moore,

Chief Gardener.

Niagara Falls, Ontario, March 9th, 1911.

APPENDIX "F"

COPY OF BY-LAW.

VILLAGE OF CHIPPAWA.

By-law no. 255.

A By-law to license and grant power to the Commissioners for the Queen Victoria Niagara Falls Park, by means of a new avenue to connect the Park with the Esplanade along the bank of the Niagara River, passing on the streets of Chippawa, improving and ornamenting the same.

WHEREAS the Lieutenant-Governor in Council by Order of the 19th August, 1910, has consented to the Commissioners for the Queen Victoria Niagara Falls Park acquiring such lands, tenements and rights as they think expedient to

be acquired for the purpose of making a new avenue or approach between the southern boundary of the Park and the Esplanade now being constructed so as to form a continuous public highway route between the Park and the Esplanade.

AND WHEREAS the Corporation of the Village of Chippawa deem it to be in the best interests of the Village of Chippawa, its inhabitants, ratepayers and property owners to further the construction of the said avenue, upon the line of route through the Village hereinafter specified.

Be it therefore enacted by the Corporation of the Village of Chippawa, that the said Corporation by its Municipal Council in due form of law do license and authorize the Reeve and Council to enter into an agreement with the Commissioners for the Queen Victoria Niagara Falls Park, subject to the limitations contained in the Consolidated Municipal Act, 1903, and the amendments thereto whereby the Commissioners, their servants or agents, may enter upon the highways and public places within the Corporate limits of the said Village as follows:

From that point on Macklem Street within the limits of the Old Military Reserve, and being that part of Macklem Street as extended or known as extended, said point being 251.2 feet north-easterly, measured on the centre line of Macklem Street, produced from the southerly limit of the Old Military Reserve, thence through Macklem Street south-westerly at a distance of 15 feet on each side of the said centre line to the centre of Bridgewater Street, then southerly along the centre of Bridgewater Street and at a distance of 15 feet on each side of the said centre line as far as the Steel Bridge.

Then again from the southerly side of the Steel Bridge at a point being (as near as may be) on the centre of Church Street, produced north-westerly and a distance of 15 feet on each side of the centre line of Water Street, produced south-westerly to the western limit of the Esplanade.

An additional width adjoining Water Street, produced south-westerly as shown on the accompanying plan.

The whole of the said line of route to be defined according to scale upon a plan and verified by the proper Corporate Authorities to remain in the office of the Clerk of the Corporation of the Village of Chippawa and a duplicate thereof to be delivered to the Commissioners.

And upon the said highways and public places as hereinbefore described, to make and form thereon the avenue hereinbefore described and to have and hold control thereof, together with the privilege of planting trees along said highways and public places before described and outside the width of the avenue during such holding, which holding by the Commissioners of the said avenue shall continue as long as the same shall be kept and maintained by the Commissioners without cost to the Village, as a first-class highway for the purposes of all public traffic which may lawfully pass over and along or be required to pass over and along the same.

The license to be granted by said agreement shall include all necessary rights of repair, and of drainage, doing no unnecessary damage, and the extent and position of tree planting as the Commissioners may at any time think proper, such trees so planted by the Commissioners within or without any part of any street, highway or public place over which the said license shall extend to be the property of the Corporation of the Village of Chippawa. Nothing in the said license contained or in the agreement hereby authorized to be made and entered into, shall restrict the Corporation of the Village of Chippawa at all times to do, perform and execute upon and across the said avenue (so as to be constructed by the Commissioners as hereinbefore provided) such works as may be undertaken or ordered

by By-law of the said Corporation, such works to be at the cost and expense of such Corporation as also the restoration necessary and consequent on such works of restoring the said avenue to its former condition provided that the Corporation of the Village of Chippawa shall not by any By-law or how otherwise permit the erection of any buildings or works which in any way interfere with the full use and application of the said avenue or upon any street, highway or public place, or any part thereof over which the said license shall extend.

That this By-law shall take effect on the passing thereof.

Read a third time and passed in Council this 9th day of October, 1910.

(Signed) W. E. B. McKenzie,
Reeve.
(Signed) Chas. Weinbrenner,
Clerk.

Notice.—The above is a true copy of a By-law passed by the Municipal Council of the Corporation of the Village of Chippawa on the 29th day of October, 1910, and all persons are hereby required to take notice that any one desirous of applying to have such By-law or any part thereof quashed must make his application for that purpose to the High Court of Justice, within three months next after the publication of this notice once a week for three successive weeks in the newspaper called the *Welland Telegraph,* or he will be too late to be heard in that behalf.

APPENDIX "G."

AGREEMENT made this 7th day of March, 1911.

BETWEEN the Corporation of the Village of Chippawa, hereinafter called the Corporation, of the first part, and

The Commissioners for the Queen Victoria Niagara Falls Park,, hereinafter called the Commissioners, of the second part.

WHEREAS on the twenty-ninth day of October, 1910, The Corporation of the Village of Chippawa passed a By-law number 255 in the words and figures following and duly promulgated the same as published once a week for three successive weeks in the newspaper published in Welland called the *Welland Telegraph.*

NOW THIS AGREEMENT WITNESSETH that in consideration of the premises the Reeve and Council of the said Village of Chippawa do hereby grant the Commissioners, their servants or agents, the right to enter upon all highways or public places within the corporate limits of the said Village as follows:

From that point on Macklem Street within the limits of the Old Military Reserve and being that part of Macklem Street as extended or known as extended, said point being 251.2 feet north-easterly, measured on the centre line of Macklem Street, produced from the southerly limit of the Old Military Reserve, thence through Macklem Street south-westerly at a distance of 15 feet on each side of the said centre line to the centre of Bridgewater Street, thence southerly along the centre of Bridgewater street at a distance of 15 feet no each side of the said centre line as far as the Steel Bridge.

Then again from the southerly side of the Steel Bridge at a point being (as near as may be) on the centre of Church Street, produced north-westerly, and a distance

of 15 feet on each side of the centre line of Water Street, produced south-westerly to the western limit of the Esplanade and an additional width adjoining Water Street, produced south-westerly as shown on the accompanying plan.

The whole of the said line of route to be defined according to scale upon a plan and verified by the proper corporate authorities, to remain in the office of the Clerk of the Corporation of the Village of Chippawa, and a duplicate thereof to be delivered to the Commissioners.

And upon the said highways and public places as hereinbefore described to make and form thereon the avenue hereinbefore described and to have and hold control thereof; together with the privilege of planting trees along said highways and public places before described and outside the width of the avenue, during such holding, which holding by the Commissioners of the said avenue shall continue as long as the same shall be kept and maintained by the Commissioners without cost to the Village as a first-class highway for the purpose of all public traffic which may lawfully pass over and along or be required to pass over and along the same.

It is further agreed that the Commissioners shall have all necessary rights of repair and of drainage, doing no unnecessary damage, and the extent and position of tree planting as they may at any time think proper. Such trees so planted by them within or without any part of the street highway or public place over which the said agreement shall extend to be the property of the Corporation.

Nothing in this Agreement shall restrict the Corporation at all times to do, perform and execute upon and across the said avenue (so to be constructed by the Commissioners as hereinbefore provided) such works as may be undertaken or ordered by By-law of the said Corporation as also the restoration necessary and consequent on such works of restoring the said avenue to its former condition provided that the Corporation of the Village of Chippawa shall not by any By-law or how otherwise permit the erection of any buildings or works which in any way interfere with the full use and application of the said avenue or upon any street, highway or public place or any part thereof over which the said Agreement shall extend.

IN WITNESS WHEREOF the parties hereto have severally caused their corporate seals to be affixed hereunto and these presents to be executed by their respective officers threunto duly authorized, the day and year first above written.

W. E. B. McKenzie,
Reeve.

Chas. Weinbrenner,
Clerk.

(SEAL)

J. W. Langmuir,
Chairman, Queen Victoria Niagara Falls Park Commission.

APPENDIX "H"

THIS INDENTURE made in quadruplicate this fifth day of August, A.D. 1910,

BETWEEN His Majesty King George the Fifth of the first part.

The Canada Foundry Company, Limited, hereinafter called "the Foundry Company," of the second part.

The Canadian General Electric Company, Limited, hereinafter called "the Electric Company," of the third part, and

The Commissioners for the Queen Victoria Niagara Falls Park, acting herein on their own behalf as well as on behalf and with the approval of the Government of the Province of Ontario, hereinafter called "the Commissioners," of the fourth part.

WHEREAS the Foundry Company under and by virtue of a certain Agreement bearing date the twenty-eighth day of July, 1910, and made between the Canadian Bank of Commerce and the Foundry Company, has acquired a certain equity and right of purchase of the lands, rights, franchises and liberties therein particularly described, the same being the lands in the Township of Bertie, at one time owned by The Canadian Shipbuilding Company, Limited;

AND WHEREAS the Foundry Company has made application to the Lieutenant-Governor in Council to enlarge certain rights, interests and privileges in regard to the said lands, which were granted to The Canadian Shipbuilding Company, Limited, under and by virtue of a certain Indenture bearing date the 30th day of December, 1903, which rights, interests and privileges are fully set out in the Order in Council hereinafter recited;

AND WHEREAS the Foundry Company has also applied to the Lieutenant-Governor in Council for a conveyance to it in fee simple of a certain water lot or land covered with water, the property of the Crown, being part of the foreshore and bed of the River Niagara, containing 4.24 acres, and more particularly hereinafter described;

AND WHEREAS the Foundry Company has also applied to the Lieutenant-Governor in Council for certain rights and privileges over another certain water lot or land covered with water, the property of the Crown, containing 7 acres, and hereinafter more particularly described;

AND WHEREAS it has been agreed by and between the parties hereto that certain parcels of land which are marked upon the plan hereto annexed as O, P, Q, R, S and U should be conveyed by and between the parties hereto as hereinafter particularly set forth in the said Order in Council and in these presents;

AND WHEREAS the Lieutenant-Governor in Council has considered the said application of the Foundry Company and also the recommendation and suggestions of the Commissioners, and has ordered, as appears more particularly in an Order in Council bearing date the twenty-ninth day of July, 1910, a copy of which hereafter immediately follows:—

The Committee of Council have had under consideration the annexed report of the Honourable the Minister of Lands, Forests and Mines, with reference to the application of The Canadian Bank of Commerce, and the Canada Foundry Company, Limited, for an extension of the rights and privileges granted by an Order in Council of the 11th December, 1903, with respect to a certain water lot therein particularly described, and to enable the Foundry Company to acquire and hold certain parts of the strip of land, also in the said report described, and formerly known as the Chain Reserve, part of which is held by the Canadian Shipbuilding Company, Limited, under a license from the Commissioners of the Queen Victoria Niagara Falls Park, and other parts now vested by legislative authority in the Crown as public work known as the Esplanade, and to change the location of certain highways as described in the said report, and advise that the recommendation of the Minister, as contained in his report, be concurred in and acted on.

July 29th, A.D. 1910.

(Sgd.) J. Lonsdale Capreol,
Clerk, Executive Council.

To His Honour The Lieutenant-Governor in Council.

1. The undersigned has had under consideration the application of the Canadian Bank of Commerce and the Canada Foundry Company, Limited, hereinafter called "the Foundry Company," for an extension of the rights and privileges granted by the Order of the Lieutenant-Governor in Council, passed on the 11th day of December, 1903, with respect to a certain water lot therein particularly described, and to enable the Foundry Company to acquire and hold certain parts of the strip of land hereinafter described and formerly known as the Chain Reserve, part of which is held by The Canadian Shipbuilding Company, Limited, under a license from the Commissioners of the Queen Victoria Niagara Falls Park, and other parts now vested by legislative authority in the Crown as a public work, known as the Esplanade, and to change the location of certain highways as hereinafter described, and begs to report as follows:—

2. It is represented that under and by virtue of a certain Indenture made on the 30th day of December, 1903, between His Majesty King Edward the Seventh of the first part, and The Canadian Shipbuilding Company, Limited, a Corporation duly formed under the laws of the legislature of Ontario, of the second part, and the Commissioners for the Queen Victoria Niagara Falls Park, acting therein on their own behalf, as well as on behalf and with the approval of the Government of the Province of Ontario, hereinafter called "the Commissioners," of the third part, among other things therein provided and agreed. His Majesty the King, acting therein by the Commissioner of Crown Lands for Ontario, did, pursuant to the said Order in Council, grant to the said The Canadian Shipbuilding Company, Limited, and its assigns, a license to enter, take, use and occupy the water lot or lands covered with water in front of lot number nine in the cross concession, and parts of lots thirteen and fourteen in the fifth concession of the Niagara River, in the Township of Bertie, in the County of Welland, in the Province of Ontario, as therein particularly described, subject to certain conditions, obligations, stipulations and restrictions, and with the benefits, rights and advantages provided for and specially set forth therein, for the purposes of carrying on a shipbuilding business and other purposes auxiliary thereto. And His Majesty by the said Indenture also did further Grant, in pursuance of power in an Act passed in the third year of the reign of our late Sovereign, Edward VII., Chaptered 6, and Section 13, relating to the construction of works of improvement along the bank of the upper Niagara River, to the said The Canadian Shipbuilding Company, Limited, and its assigns, (in which Grant the Commissioners joined as Grantors, as empowered by said Section 13), a license to enter, take, use and occupy the lands lying between the lands of which the said The Canadian Shipbuilding Company, Limited, hereinafter called "the Ship Company," were then owners in fee and the said water lot, subject to certain conditions, obligations, stipulations and restrictions as aforesaid:

3. AND WHEREAS the business of shipbuilding, for which the said Ship Company was incorporated, and to aid in the carrying on of which the said conveyance was made, did not meet with the success that was anticipated, and it is shown by the applicants that a large capital sum has been expended on the enterprise, and that by the extensions now asked the development not only of a large local business, but also wide benefits to the project of extending a large foundry business within the Province of Ontario are confidently expected;

4. AND WHEREAS it is shown by the applicants that an increased value will be given to the said enterprise, and to that end greater facilities for carrying on their business and an extension of the River frontage are of great importance;

5. AND WHEREAS a certain Order was made by the High Court of Justice, bearing date the 21st day of January, 1908, to wind up the said Ship Company, and E. R. C. Clarkson was appointed liquidator thereunder;

6. AND WHEREAS under and by virtue of a certain deed bearing date the fifteenth day of July, 1910, the said Ship Company has conveyed the lands belonging to it and all the rights, privileges, liberties and easements belonging thereto to the Canadian Bank of Commerce for considerations therein set forth and expressed;

7. AND WHEREAS the said the Canadian Bank of Commerce have made an agreement with the Foundry Company to convey to it the said lands and all the said rights, privileges, liberties and easements, upon payment of certain sums of money from year to year, as therein set forth, and under the conditions as therein set forth;

8. AND WHEREAS the Foundry Company or its assigns proposes to use the said lands so conveyed to it and other lands contiguous thereto and now owned by the Canadian General Electric Company, Limited, hereinafter called "the Electric Company," as hereinafter mentioned to carry on the business of shipbuilding and the business of a general foundry and machine shop business, and of every description of manufacture of iron and steel or other metal work or in connection therewith, and to deal in the same, and it requires for that purpose extended River frontage and access to the River bank for launching and docking vessels and for other purposes connected with the said industries;

9. AND WHEREAS the Electric Company is seized of certain other lands to the north and south of the said lands formerly owned by the Ship Company as aforesaid, which certain other lands are particularly described as follows: Part of lot number fourteen in the Fifth concession of the Township of Bertie and parts of lots numbers seven eight and nine in the cross concession of the Township of Bertie, as set forth in a certain plan now exhibited and annexed hereto, and the Foundry Company or its assigns, taking a title from the Electric Company, proposes to use the said lands in connection with its said other lands to carry on the business of shipbuilding and the business of a general foundry and machine shop business as aforesaid, and it requires for that purpose access to the river bank in front of these last mentioned lands for launching and for docking vessels and for other purposes connected with the said industries;

10. AND WHEREAS in order to obtain access to the River it is necessary that the Foundry Company or its assigns should be authorized to extend its works upon and across the public highways situated on the river bank as hereinbefore described, being the Chain Reserve in front of the said lands so held by the Electric Company and hereinafter more particularly described by metes and bounds, to wit, being parcel O and parcel R as set forth on said plan, and also to utilize for any of their said business purposes the water lots and foreshores of the River now belonging to the Province of Ontario, hereinafter more particularly described by metes and bounds in paragraph 17 hereof;

11. The Foundry Company and the Electric Company, according to their respective titles, agreeing to grant and actually granting to His Majesty the King, as and for the public work of the Esplanade, the lands following: —

(*a*) Parcel T on the said plan, which is particularly described by metes and bounds in the said Order in Council.

(*b*) Parcel V on the said plan, which is particularly described by metes and bounds, in the said Order in Council.

12. THE FOUNDRY COMPANY AND THE ELECTRIC COMPANY, according to their respective titles, agreeing to grant and actually granting to His Majesty the King, for the public uses of the Province of Ontario, those parcels lettered S and U on said plan, being particularly described by metes and bounds as follows:—

Here follows the description by metes and bounds in the said Order in Council.

13. AND WHEREAS it has been agreed, all legal difficulties being removed, to close certain roadways running westerly from Niagara River, and colored yellow on a certain plan now produced, and to divert the same as set forth on the said plan, and that the road allowances marked O. P. Q. and R, colored yellow on the said plan, and that part formerly of the Chain Reserve stretching along the River bank between the parcels O and R, are to be conveyed to the said Foundry Company by His Majesty the King in fee simple, aided by proper Municipal By-laws and confirmed and made absolute by an Act of the Legislature of the Province of Ontario;

14. AND WHEREAS the Commissioners have represented that works for the said purposes in the locality indicated would be of general advantage, and have approved of the said map or plan attached hereto, subject to the approval of the Lieutenant-Governor in Council, whereby the objects in view may be secured by a change made in the highway on the River bank without inconvenience to public use;

15. AND WHEREAS The Canadian Bank of Commerce and the Foundry Company have prayed the Lieutenant-Governor in Council to consent to and approve of the said recited grant to The Canadian Bank of Commerce and also approve of the said agreement between The Canadian Bank of Commerce and the Foundry Company;

16. IN VIEW OF THE ABOVE IT IS RESPECTFULLY RECOMMENDED AS FOLLOWS:—

That the purposes and objects aforesaid for which the said water lot, particularly described in the said Conveyance of the 30th December, 1903, has been heretofore used be enlarged so that the same shall include not only the business of shipbuilding and other purposes as heretofore, but also the business of a general foundry and machine shop business, and every description of manufacture of iron and steel and other metal work, or in connection therewith, and to deal in the same and that the powers granted in respect of the said water lot be enlarged accordingly, but said water lot shall not be used for commercial purposes, or as a shipping port, nor for the erection of elevators, but shall be restricted to such purposes as are necessary for the landing, receiving and storage of raw materials, coal, ores and the like, necessarily required for use on the works erected or to be erected upon the lands now held by the Foundry Company or Electric Company and for the transportation of their several manufactured and other products from their said works, but no such works are to be erected on the water lot;

17. THAT for the object and purpose of establishing and carrying on any of the businesses aforesaid on the said lands and premises, the Minister of Lands, Forests and Mines, representing His Majesty the King, to grant to the said Foundry Company one of the said above-mentioned water lots in fee simple, being described as:—

Here follows the description by metes and bounds in the said Order in Council.

THAT for the said object and purpose the Minister of Lands, Forests and Mines, representing His Majesty the King, to grant to the said Foundry Com-

pany a license (subject to the conditions hereinafter limited and contained and revocable only on non-performance of or non-compliance with such conditions or any of them), to enter, take, use and occupy the other of the said above-mentioned water lots particularly described as,

ALL AND SINGULAR that certain parcel or tract of land covered by the waters of the Niagara River, situate, lying and being opposite a part of lot number fourteen, in concession five, Niagara River, in the Township of Bertie, in the County of Welland and Province of Ontario, containing by admeasurement seven acres (7 ac.), be the same more or less, and which said parcel is more particularly described as follows:—

Here follows the description by metes and bounds in the Order in Council.

WHICH SHALL BE SUBJECT TO THE SAME RESTRICTIONS AS TO USES AND HOLDING AS APPLY TO SAID WATER LOT DESCRIBED IN SAID CONVEYANCE OF THE 30TH DECEMBER, 1903;

18. AND that for the object and purpose aforesaid His Majesty the King to grant to the said Foundry Company or its assigns, in which grant the Commissioners shall join as Grantors, in respect to any interest, right or title which they may have therein, the said road allowances marked O, P, Q and R, colored yellow on the said plan and particularly described, and that part of Esplanade lying between said parcels O and R lying along the said River bank in fee simple. Said parcels O, P, Q and R being described by metes and bounds in the said Order in Council.

PROVIDED ALSO that such grants are not to be construed as expressing or implying any covenants by His Majesty the King or by the Commissioners for the title or quiet possession.

19. THE GRANT by way of license, as aforesaid, by His Majesty to the said Foundry Company of the said two water lots for the enlarged purposes aforesaid is conditional upon the carrying out and compliance with the terms and conditions following:

1. THAT the sum of Five Hundred Dollars ($500.00) for each and every year during the occupation by the Foundry Company of the Water Lot mentioned in the said Indenture of the 30th December, 1903, be paid by the Foundry Company to the Minister of Lands, Forests and Mines, at the Office of the Department, Parliament Buildings, Toronto, in advance, as the annual license fee for the occupation, subject to the aforesaid conditions, terms and limitations of the said Water lot, the first payment to be made upon the First day of January, 1911, and to continue to be payable on every First day of January thereafter.

2. THAT the sum of $208.00 for each and every year during the occupation by the Foundry Company of the Water Lot secondly above described in paragraph Number 17 hereof, containing seven acres, be paid by the Foundry Company to the Minister of Lands, Forests and Mines, at the Office of the Department, Parliament Buildings, Toronto, in advance, as the annual license fee for the occupation, subject to the aforesaid conditions, terms and limitations of the said Water Lot, the first payment to be made in advance upon the day of the date of the execution and delivery of the Conveyance thereof to the Foundry Company, and to continue to be payable yearly thereafter.

3. THAT neither the Foundry Company nor any assignee or person claiming under it shall use the said Water Lots mentioned in paragraph Number 2 and in the second part of paragraph Number 17, or either of them, which are the subject of the said licenses from the Crown, as represented by the Minister of Lands, Forests and Mines, for the purposes other than as hereinbefore provided.

4. THAT the Foundry Company shall not assign separately or as separate tenements the Water Lots or either of them, which are the subject of the said licenses from the Crown, as represented by the Minister of Lands, Forests and Mines, for the purposes other than as hereinbefore provided without the permission of the Lieutenant-Governor in Council, nor shall the same or any part thereof be transferable or assignable by operation of law as against the Company.

20. SUCH PERMISSION shall extend only to permission actually given or to the actual assignment thereby specifically authorized to be done, but not so as to prevent a proceeding for any subsequent breach in respect of other lands which are the subject of such licenses or grants by the Crown, not included in such permission, and all rights under covenants and powers of forfeiture and re-entry in the licenses contained shall remain in full force and virtue as if no such permission had been given.

21. BUT THIS RESTRICTION on the power or incidence of assignment shall not apply to the lands held by the Foundry Company or Electric Company, as aforesaid, nor to an assignment of the Water Lots, which are the subject of the said licenses if and when assigned by way of sale or mortgage in connection with the said lands now held by the Foundry Company or Electric Company, as aforesaid, or such parts thereof as may be used by the Foundry Company or Electric Company for their business purposes, in case the said Water Lots, which are the subject of the said licenses, are sold or mortgaged with such of the lands which may then be owned, held and used by the Foundry Company or Electric Company as aforesaid, as one property, and used for any of the business purposes aforesaid.

22. IN RESPECT of the said conditions Numbers 1, 2, 3 and 4, it is hereby declared that if the Foundry Company should fail to pay the annual license fee, as provided in Conditions Numbers 1 and 2, or if the Foundry Company or assigns should at any time continuously neglect for the space of three years to carry on any of the businesses as aforesaid on the lands and premises held by the Foundry Company or Electric Company, as aforesaid, or should the Foundry Company at any time fail to observe and keep the provisions of and contained in Conditions Numbered 3 and 4, or disregard any of the foregoing provisions or conditions, or be affected by any proceeding or operation of law as hereinbefore provided, then the Lieutenant-Governor in Council, on notice to the Foundry Company, and after hearing, may forfeit all right, claim or demand of or to any or all of the said Water Lots, the subject of the grant by way of license as hereinbefore provided; and His Majesty the King may re-enter thereon as of his former estate, without let, suit or hindrance by the Foundry Company or anyone claiming thereunder.

23. THE LIEUTENANT-GOVERNOR IN COUNCIL may nevertheless relieve against any forfeiture, neglect or transgression deemed to have been incurred, and the waiving by the Lieutenant-Governor in Council of any forfeiture, neglect or transgression or of any matter or thing deemed to have been a forfeiture, neglect or transgression, shall not affect the right of the Lieutenant-Governor in Council to revive such forfeiture, neglect or transgression in case any condition on which it was waived is broken, or to again declare a forfeiture in respect of the same matter, or to declare a forfeiture in respect of the other matters at any subsequent time or times.

24. SUBJECT to any general or special Act of the Legislature of the Province of Ontario applicable to the said Company, it is further declared that upon the said Conditions Numbered 1, 2, 3 and 4 being complied with by the said Foundry Company, in respect of the matters whereof there has been forfeiture, neglect or failure to observe such conditions as the Lieutenant-Governor in Council shall have

deemed to be forfeiture, neglect or failure, and upon the Foundry Company giving such security as the Lieutenant-Governor in Council may require, to secure the due performance by the Foundry Company of the Conditions Numbered 1, 2, 3 and 4, then the whole of the said Water Lots shall be vested, by way of license, as hereinbefore provided; and any other securities satisfactory to the Government may, from time to time, be substituted for the security so given by the said Company.

25. THAT the Foundry Company agree to open, form, and construct the highways marked upon the said Plan, being lettered S and U, and the highway connecting parcels S and U, as set out on the said Plan, in lieu of the highways marked upon the said Plan as Parcels O, P, Q and R, now abandoned and closed, so that the same shall be in character uniform with the highway to be constructed along the River Bank by the Commissioners, as the said highway is by the said Commissioners intended to be finally completed, but that the Foundry Company shall not be required to maintain and keep in repair the same.

26. THAT the Foundry Company, at the time of the execution and delivery of the conveyances to be executed hereunder, do pay to John W. Langmuir, of the City of Toronto, in the County of York, Esquire, the sum of Nine Thousand Six Hundred Dollars ($9,600), to be expended by him in the construction of the highways above described, as agreed to be opened and formed, which sum the said John W. Langmuir shall apply to discharge the cost of building the same to any contractor or contractors he may select, but any part of the said sum of Nine Thousand Six Hundred Dollars ($9,600) which he shall not have spent to complete the same shall be accounted for by the said John W. Langmuir to the said Foundry Company.

27. THAT the said highways when opened, formed and constructed on the said lands shall then be declared to be the highways constructed in substitution for the highways directed to be constructed by the said Order-in-Council of 11th December, 1903, and thereupon the said highways marked as Parcels O, P, Q and R shall be forever closed.

28. THAT His Majesty do approve of and consent to the said conveyance by the said Ship Company to the Canadian Bank of Commerce, and the said Agreement between the Canadian Bank of Commerce and the Foundry Company.

29. THAT an Act of the Legislature of Ontario be duly passed at the next Session thereof, giving full effect and validating and confirming the said closing up and granting the said existing highways and that portion of the Chain Reserve along the River Bank between Parcels O and R on the said Plan, and the opening up of the new highways aforesaid, and the necessary conveyances to be drawn and executed effectuating the requirements, obligations, rights and privileges hereinabove set forth.

(Sgd.) F. COCHRANE,
Minister of Lands, Forests and Mines.

28th July, 1910.

NOW, THEREFORE, THIS INDENTURE WITNESSETH that for and in consideration of the matters hereinbefore set forth and the due performance and fulfilment by the Foundry Company of the terms, conditions, stipulations, promises and provisos hereinbefore recited, as set forth in the Report of the Honourable Francis Cochrane, Minister of Lands, Forests and Mines, the said Report being concurred in and acted on by the said Lieutenant-Governor in Council, the said Report and Order being hereinbefore recited and set forth, His Majesty the King, acting therein by the Minister of Lands, Forests and Mines, DOTH GRANT to the Foun-

dry Company and its successors and assigns a license as, in and by the said Order-in-Council limited and provided, and being hereby declared to be in accordance with such Order-in-Council, to enter, take, use and occupy the Water Lot or lands covered with water in front of said Lots Numbered 9, 13 and 14, beginning at a point at the water's edge of the Niagara River at a distance of 80 feet northerly and easterly from a line produced to the water's edge of the easterly limit of the lands at one time sold to the Canadian Shipbuilding Company, Limited, by Henry O'Brien, and then extending northerly and easterly down the stream to a point at the water's edge where a line produced from the southerly edge of the Ridge Road would meet the same, according to a Plan made in triplicate by an Ontario Land Surveyor of the said Water Lot, and filed in the Department of Lands, Forests and Mines (the whole of which said Water Lot, or lands covered with water, are shown on the Plan hereto attached, marked "Water Lot, Occupation License No. 357," the same having an area of 16 4-5 acres), and also the Water Lot, or lands covered with water, described as:—

ALL AND SINGULAR that certain parcel or tract of land covered by the waters of the Niagara River, situate, lying and being opposite a part of Lot Number Fourteen, in Concession Five, Niagara River, in the Township of Bertie, in the County of Welland and Province of Ontario, containing by admeasurement seven acres (7 ac.), be the same more or less, and which said parcel is more particularly described as follows:—

COMMENCING at a point in the margin of the left bank of the Niagara River, as intersected by the north-westerly limit of Water Lot covered by License of Occupation Number 357, of record in the Department of Lands, Forests and Mines; thence north-westerly along the said margin with the stream, seven hundred and seventy-six feet (776′), more or less, to a point where the same is intersected by the easterly limit of a road eighty feet (80′) in width, as laid out according to a Plan by Ontario Land Surveyors Speight & Van Nostrand, dated 29th March, 1910, and about to be filed in the Registry Office for the said County; thence north thirty-six degrees and fifty-eight minutes (36d. 58′) east, parallel to the north-westerly limit of the Water Lot, covered as aforesaid, four hundred feet (400′); thence south-easterly in a straight line to the most northerly angle of the Water Lot covered as aforesaid; thence south thirty-six degrees and fifty-eight minutes (36d. 58′) west, four hundred feet (400′), more or less, to the place of beginning.

The said parcel being further shown colored red on a Plan of Survey made by Ontario Land Surveyors Speight & Van Nostrand, dated 7th day of April, 1910, and of record in the Department of Lands, Forests and Mines, and shown on the Plan hereto attached, marked "Application of the Canada Foundry Company, Limited, area 7 acres."

WHICH SHALL BE SUBJECT TO THE SAME RESTRICTIONS AS TO USES AND HOLDINGS AS APPLY TO SAID WATER LOT DESCRIBED IN SAID CONVEYANCE OF THE 30TH DECEMBER, 1903:

TO HAVE AND TO HOLD the same subject to the conditions, obligations, stipulations and restrictions, and with the benefits, rights and advantages provided for and contained in the hereinbefore recited Order of the Lieutenant-Governor in Council, concurring in and acting on the hereinbefore recited Report of the Minister of Lands, Forests and Mines, which forms part of the said Order as applicable to the license granted in respect of and relating to the said Water Lots, or lands covered with water, containing respectively 16 4-5 acres, more or less, and 7 acres, more or less.

And the Foundry Company for itself and its assigns doth hereby covenant with His Majesty the King that for and notwithstanding the terms, conditions, stipulations, promises and provisos hereinbefore contained and the rights of forfeiture in terms hereinbefore provided in respect of the said licenses, to which the said rights of forfeiture are severally applicable, and not suffering or permitting any forfeiture thereunder to be varied or affected by this covenant, that the Foundry Company will duly observe and perform the obligations hereinbefore contained in the hereinbefore recited Order-in-Council and Report relating thereto and numbered 1, 2, 3 and 4, as follows:—

1. THAT the sum of Five Hundred Dollars ($500.00) for each and every year during the occupation by the Foundry Company of the Water Lot mentioned in the said Indenture of the 30th December, 1903 be paid by the Foundry Company to the Minister of Lands, Forests and Mines, at the Office of the Department, Parliament Buildings, Toronto, in advance, as the annual license fee for the occupation, subject to the aforesaid conditions, terms and limitations of the said Water Lot, the first payment to be made upon the First day of January, 1911, and to continue to be payable on every First day of January thereafter.

2. THAT the sum of $208.00 for each and every year during the occupation by the Foundry Company of the Water Lot secondly above described in paragraph Number 17 hereof, containing seven acres, be paid by the Foundry Company to the Minister of Lands, Forests and Mines, at the Office of the Department, Parliament Buildings, Toronto, in advance, as the annual license fee for the occupation, subject to the aforesaid conditions, terms and limitations of the said Water Lot, the first payment to be made in advance upon the day of the date of the execution and delivery of the conveyance thereof to the Foundry Company, and to continue to be payable yearly thereafter.

3. THAT neither the Foundry Company nor any assignee or person claiming under it shall use the said Water Lots mentioned in paragraph Number 2 and in the second part of paragraph Number 17, or either of them, which are the subject of the said licenses from the Crown, as represented by the Minister of Lands, Forests and Mines, for the purposes other than as hereinbefore provided.

4. THAT the Foundry Company shall not assign separately or as separate tenements the Water Lots or either of them, which are the subject of the said licenses from the Crown, as represented by the Minister of Lands, Forests and Mines, for the purposes other than as hereinbefore provided, without the permission of the Lieutenant-Governor in Council, nor shall the same or any part thereof be transferable or assignable by operation of law as against the Company.

AND THIS INDENTURE FURTHER WITNESSETH that in consideration of the premises and in further consideration of the sum of One Dollar of lawful money of Canada now paid by the Foundry Company to His Majesty, His Majesty doth grant unto the Foundry Company in fee simple (in which grant the Commissioners do join as grantors in respect to any interest, right or title which they may have therein) the said road allowances marked O, P, Q and R, colored yellow on the said Plan hereto attached, and particularly described, and also that portion of the Esplanade lying between said Parcels O and R and lying along the bank of the Niagara River and extending to the said Water Lot, containing sixteen and four-fifths acres, said Parcels O, P, Q and R being described by metes and bounds, as follows:

PARCEL O—Being composed of that part of the Chain Reserve in front of Lot Number Fourteen, in Concession Five, Niagara River, of the said Township, and which said Parcel O is more particularly described as follows:—

COMMENCING at the intersection of the south-western limit of the Ridge Road as widened, with the south-western limit of the River Road; thence north forty-three degrees and eight minutes (43d. 8′) west, along the line of fence forming the south-western limit of the said River Road, seven hundred and twenty-two feet and six and three-quarter inches (722′ 6¾″) to a stake planted; thence north sixteen degrees and fifty-four minutes (16 d. 54′) east, to the margin of the Niagara River; thence south-easterly along the said margin, against the stream, to the said south-western limit of the Ridge Road produced north-easterly; thence south thirty-five degrees and fifteen minutes (35 d. 15′) west, thirty-two feet (32′), more or less, to the place of beginning.

PARCEL P—Being composed of parts of lots numbers thirteen and fourteen, in said concession five; and which said Parcel P is more particularly described as follows:—

COMMENCING at the intersection of the said western limit of the Ridge Road produced north-easterly with the south-western margin of the Niagara River; thence south thirty-five degrees and fifteen minutes (35 d. 15′) west, along the north-western limit of said Parcel P, eleven hundred and ninety-four feet and five inches (1194′ 5″); thence south-easterly on a curve to the left, having a radius of four hundred and eighty-one feet and half an inch (481′ ½″), one hundred and eight feet and five inches (108′ 5″) to a point of tangent; thence south fifty-four degrees (54 d.) east, sixty feet (60′) more or less, to a point of tangent in the north-easterly limit of lands described in a certain Deed dated 30th December, 1903, between His Majesty King Edward VII. of the first part, the Canadian Shipbuilding Company of the second part and the Commissioners of the Queen Victoria Niagara Falls Park of the third part; thence north-westerly on a curve to the right, having a radius of one hundred and ten feet (110′) along the said limit of lands so conveyed, one hundred and seventy-three feet (173′), more or less, to a point of tangent; thence north thirty-five degrees and fifteen minutes (35 d. 15′) east, along the said limit of lands conveyed as aforesaid and along the production of the same, being along a line distant eighty feet (80′) south-easterly from the said north-westerly limit of Parcel P, ten hundred and twenty-five feet (1025′), more or less, to the said margin of the Niagara River; thence northerly along the last mentioned margin, with the stream, to the place of beginning.

PARCEL Q—Being composed of a part of lot number 9, in the first cross concession of the said township; and which said Parcel Q is more particularly described as follows:—

COMMENCING at a point in the westerly limit of said lot number 9, where the same is intersected by the south-westerly limit of the lands conveyed as aforesaid by deed dated 30th December, 1903; thence south fifty-four degrees (54 d.) east, along the said south-westerly limit, three hundred and forty-five feet (345′), more or less, to the easterly boundary of the lands conveyed by Henry O'Brien on the 6th day of April, 1903, to the Canadian Shipbuilding Company, Limited; thence north fifteen degrees and fifty-three minutes (15 d. 53′) east, along the easterly limit of the lands conveyed by Henry O'Brien as aforesaid, twelve hundred and sixty feet (1260′), more or less, to a point distant ninety feet (90′) from the said margin of the Niagara River, measured southerly at right angles thereto; thence westerly and parallel to the said margin eighty feet (80′) to the westerly limit of lands conveyed as aforesaid by deed dated 30th December, 1903; thence south fifteen degrees and fifty-three minutes (15 d. 53′) west, along the said

westerly limit, nine hundred and ninety-six feet (996′), more or less, to a point of curve; thence on a curve to the right, having a radius of one hundred and ten feet (110′), two hundred and ten feet (210′) to a point of tangent; thence north fifty-four degrees (54 d.) west, along the north-easterly limit of lands conveyed as aforesaid by deed dated 30th December, 1903, eighty-seven feet (87′), more or less, to a curved line having a radius of three hundred and twenty-six feet and six inches (326′ 6″) and defined on the ground by posts planted; thence westerly along the last mentioned curved line, fifty feet (50′), more or less, to the westerly limit of lot number nine aforesaid; thence southerly along the last mentioned limit sixty feet (60′), more or less, to the place of beginning;

SAVING AND EXCEPTING THEREOUT and therefrom all the lands included within the hereinbefore described boundaries of Parcel Q and covered by Parcel U, hereinafter described.

PARCEL R—Being composed of that part of the Chain Reserve in front of lot number nine, in the said first cross concession of the said township, and which said Parcel R is more particularly described as follows:—

COMMENCING at a point in the southerly limit of said Parcel R, which point may be located in the following manner:—

BEGINNING at a point in the westerly limit of said lot number nine where the same is intersected by the south-westerly limit of lands conveyed as aforesaid by deed dated 30th December, 1903; thence south fifty-four degrees (54 d.) east, along the said south-westerly limit, three hundred and forty-five feet (345′), more or less, to the easterly boundary of lands conveyed by Henry O'Brien on the 6th day of April, 1903, to the Canadian Shipbuilding Company, Limited; thence north fifteen degrees and fifty-three minutes (15 d. 53′) east, along the easterly limit of the lands conveyed by Henry O'Brien as aforesaid, twelve hundred and sixty feet (1260′), more or less, to the point of commencement aforesaid, being in a line distant ninety feet (90′), from the said margin of the Niagara River, measured southerly at right angles thereto; thence easterly and parallel to the said margin, two hundred and five feet (205′), more or less, to a curved line having a radius of four hundred and twenty-two feet and half an inch (422′ ½″) and defined on the ground by posts planted; thence easterly along the aforesaid curved line to the said margin of the Niagara River; thence westerly along the said margin, with the stream, four hundred and fifty feet (450′), more or less, to the prolongation of the westerly limit of lands conveyed as aforesaid by deed dated 30th December, 1903; thence south fifteen degrees and fifty-three minutes (15 d. 53′) west, to and along the said westerly limit, ninety feet (90′); thence easterly and parallel to the said margin, eighty feet (80′), to the point of commencement aforesaid.

AND THIS INDENTURE FURTHER WITNESSETH that in consideration of the premises the Foundry Company and the Electric Company, according to their respective titles, do grant in fee simple unto His Majesty the King (such grant being in pursuance of the Act Respecting Short Forms of Conveyances) for the public uses of the Province of Ontario the parcels lettered S and U on the said plan hereto annexed, being particularly described by metes and bounds as follows:

PARCEL S—Being composed of parts of lots numbers thirteen and fourteen, in said concession five of the Township of Bertie, and which Parcel S is more particularly described as follows:—

COMMENCING at the north-easterly angle of said Parcel S, being a point which may be located in the following manner: Beginning at a point in the south-western limit of the River Road, distant seven hundred and twenty-two feet and

six and three-quarters inches (722′ 6¾″) measured on a course north forty-three degrees and eight minutes (43 d. 8′) west thereon from the north-western limit of Ridge Road; thence south sixteen degrees and fifty-four minutes (16 d. 54′) west, one hundred and three feet ten inches (103′ 10″), more or less, to the said point of commencement, being in a line drawn parallel to the said margin of the Niagara River and distant one hundred and twenty-four feet (124′) south-westerly therefrom; thence south sixteen degrees and fifty-four miuntes (16 d. 54′) west, nine hundred and thirty-nine feet and two inches (939′ 2″) to a stake planted at the beginning of a curve, having a radius of four hundred and eighty-one feet and half an inch (481′ ½″); thence south-easterly along the said curve four hundred and seventy feet (470′), more or less, to the aforesaid south-westerly limit of Ridge Road; thence south thirty-five degrees and fifteen minutes (35 d. 15′) west, along the prolongation of the last mentioned limit, eighty-three feet (83′), more or less, to a curved line parallel to the curved line last mentioned, and distant eighty feet (80′) westerly therefrom; thence northerly along a curved line having a radius of five hundred and sixty-one feet and half an inch (561′ ½″), five hundred and sixty-eight feet (568′), more or less, to a stake planted at a point of tangent; thence north sixteen degrees and fifty-four minutes (16 d. 54′) east, parallel to the easterly limit of said Parcel S., ten hundred and twenty-three feet and six inches (1023′ 6″) more or less, to the said line drawn parallel to the said margin of the Niagara River; thence south-easterly along the line drawn as aforesaid, ninety-two feet and four inches (92′ 4″), more or less, to the point of commencement aforesaid.

PARCEL U—Being composed of a part of lot number twelve in said concession five, part of lot number nine in the said first cross concession and part of the original allowance for road between the said lots, and which said Parcel U is more particularly described as follows,—

COMMENCING at a point in the north-easterly limit of lands conveyed as aforesaid by deed dated 30th December, 1903, distant thirty feet (30′), more or less, measured westerly thereon from the easterly limit of said lot number twelve, the said point being in a curved line running easterly and north-easterly, having a radius of two hundred and forty-six feet and six inches (246′ 6″) and defined on the ground by posts planted; thence south fifty-four degrees (54 d.) east, along the said north-easterly limit two hundred feet (200′), more or less, to a line curving to the left, running north-easterly and having a radius of three hundred and twenty-six feet and six inches (326′ 6″); thence north-easterly along the said curved line, two hundred and seventy five feet (275′), more or less, to a point of tangent; thence north thirty-six degrees (36 d.) east, along the said tangent six hundred and sixty feet and six inches (660′ 6″) to a point of curve; thence on a curve to the right having a radius of three hundred and forty-two feet and half an inch (342′ ½″), two hundred and eighty feet (280′), more or less, to a line distant one hundred feet (100′) southerly from the said margin of Niagara River; thence on a course about north sixty-nine degrees and twenty-seven minutes (69 d. 27′) west, along the last mentioned line, to a point in a curved line having a radius of four hundred and twenty-two feet and half an inch (422′ ½″) and being distant eighty feet (80′) from the curved line herein last mentioned; thence south-westerly along a curve to the left having a radius of four hundred and twenty-two feet and half an inch (422′ ½″) and defined on the ground by posts planted, two hundred and twenty-eight feet (228′), more or less, to a post planted to mark a point of tangent; thence south thirty-six degrees (36 d.) west, along the said tangent, six hundred and sixty feet and six inches (660′ 6″) to a point

of curve; thence on a curved line to the right having a radius of two hundred and forty-six feet and six inches (246′ 6″), three hundred and sixty-six feet (366′), more or less, to the place of beginning.

TO HAVE AND TO HOLD unto His Majesty the King, his successors and assigns, to and for his and their sole and only use forever;

AND the Foundry Company and Electric Company respectively covenant with His Majesty the King that they have between them the right to convey the said lands to His Majesty notwithstanding any act of either of them, and that His Majesty shall have quiet possession of the said lands free from all encumbrances, and that they will execute such further assurances of the said lands as may be requisite, and that neither of them has done any act to encumber the said lands, and they release to His Majesty all their claims upon the said lands;

AND THIS INDENTURE FURTHER WITNESSETH that the Foundry Company covenants to open, form and construct the highway marked upon the said plan being lettered S and U and the highway connecting parcels S and U, as set out in the said plan, in lieu of the highways marked upon the said plan as parcels O, P, Q and R, now abandoned and used, so that the same shall be in character uniform with the highway to be constructed along the River Bank by the Commissioners intended to be fairly completed; but it is understood and agreed by and between the parties hereto that the Foundry Company shall not be required to maintain and keep in repair the same.

THE FOUNDRY COMPANY at the time of the execution and delivery of these presents doth covenant with His Majesty the King to pay to John W. Langmuir, of the City of Toronto, in the County of York, Esquire, the sum of nine thousand six hundred dollars ($9,600.00), to be expended by him in the construction of the highways above described as agreed to be opened and formed, which sum the said John W. Langmuir shall apply to discharge the cost of building the same to any contractor or contractors he may select, but any part of the said sum of nine thousand six hundred dollars ($9,600.00) which he shall not have spent to complete the same shall be accounted for and paid over by the said John W. Langmuir to the Foundry Company;

AND it is hereby declared, understood and agreed that the said highways when opened, formed and constructed on the said lands shall be the highways constructed in substitution for the highways directed to be constructed by a certain Order in Council dated the 11th day of December, 1903, recited in the said indenture of the 30th of December, 1903;

AND WHEREAS it appears that the highway uncolored on the said plan hereto annexed, between parcels S and Q thereon delineated, is now vested in the Commissioners under and by virtue of the said deed of the 30th of December, 1903, as and for the public uses of the Province and it is desirable that for the sake of uniformity the title thereof be vested in His Majesty the King.

NOW THEREFORE THIS INDENTURE WITNESSETH that the Commissioners do hereby surrender any right or title they may have thereto, and grant unto His Majesty the King in fee simple, for the public uses of the Province of Ontario, the said highway lying between the said parcels S and Q, as delineated on the said plan, and measuring eighty feet in width;

AND IT IS FURTHER WITNESSED that His Majesty the King, in pursuance of the said Order in Council approves of the conveyance by the Canadian Shipbuilding Company, Limited, to the Canadian Bank of Commerce, bearing

date the 15th day of July, 1910, and the said agreement between the Canadian Bank of Commerce and the Foundry Company, bearing date the 28th day of July, 1910.

IN WITNESS WHEREOF the parties to these presents have on the day and year first above written executed the same as follows: His Majesty the King, by the sign manual of the Honourable Francis Cochrane, Minister of Lands, Forests and Mines for Ontario, and the other parties hereto by affixing their Corporate Seals respectively over the hands of their proper officers.

SIGNED, SEALED AND DELIVERED

In the presence of

GEO. W. YATES

as to Mr. Cochrane

F. COCHRANE (SEAL)

CANADA FOUNDRY COMPANY, Limited,
Per FREDERIC NICHOLLS,
Vice-President.
ERNEST J. JENKING,
Asst. Secretary.

CANADIAN GENERAL ELECTRIC CO., Limited.
Per H. P. DWIGHT,
Vice-President.
ERNEST J. JENKING,
Asst. Secretary.

J. W. LANGMUIR,
(SEAL)
Chairman.

COUNTY OF YORK, TO WIT: I, GEORGE W. YATES, of the City of Toronto, in the County of York, Secretary, make oath and say:—

1. THAT I was personally present and did see the annexed instrument and duplicate and triplicate thereof duly signed, sealed and executed by the Honourable Francis Cochrane, Minister of Lands, Forests and Mines for Ontario for His Majesty King George the Fifth, one of the parties thereto.

2. THAT the said instrument and duplicate and triplicate were executed at the City of Toronto.

3. THAT I know the said Honourable Francis Cochrane, Minister of Lands, Forests and Mines for Ontario.

4. THAT I am a subscribing witness to the said instrument and duplicate and triplicate.

SWORN before me at the City of Toronto, in the County of York, this 16th day of August, A.D. 1910.

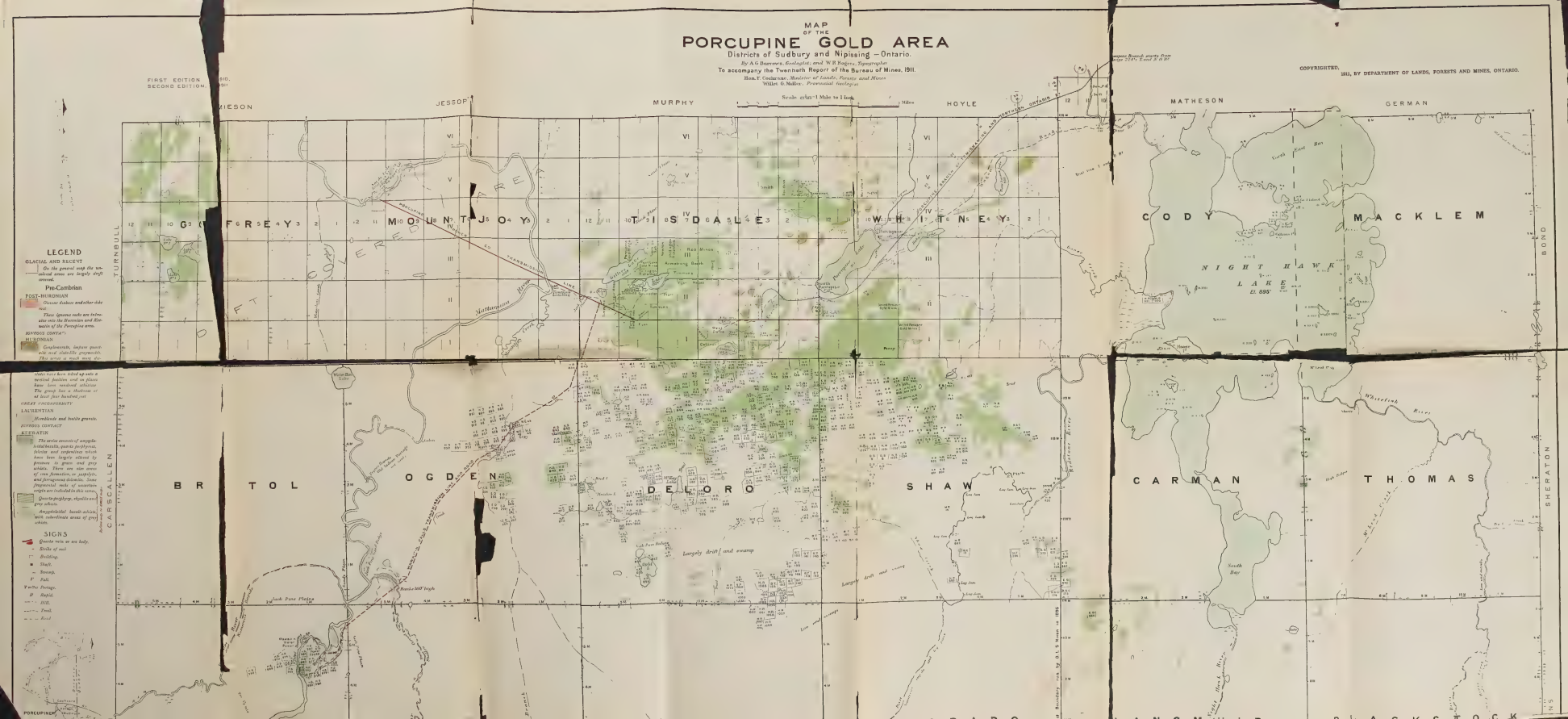
ARTHUR H. SYDERE,
A Commissioner, &c.

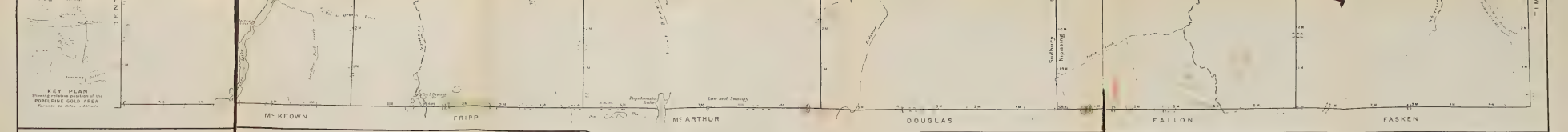
GEO. W. YATES.

QUEEN VICTORIA NIAGARA FALLS PARK.

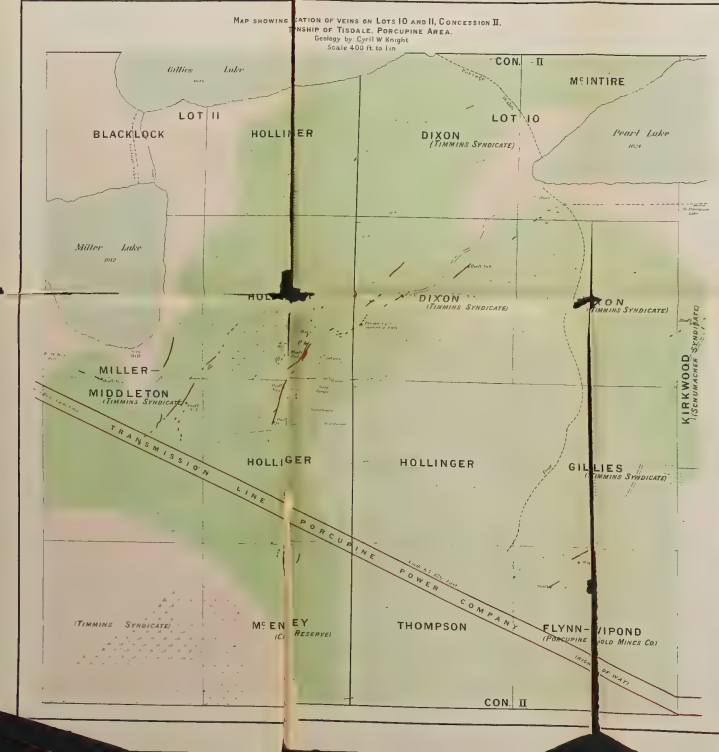
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MAP
OF THE
PORCUPINE GOLD AREA
Districts of Sudbury and Nipissing – Ontario.
By A G Burrows, Geologist; and W R Rogers, Topographer
To accompany the Twentieth Report of the Bureau of Mines, 1911.
Hon. F. Cochrane, Minister of Lands, Forests and Mines
Willet G. Miller, Provincial Geologist
Scale 40 to 1 Mile to 1 Inch
Miles
COPYRIGHTED.
1911, BY DEPARTMENT OF LANDS, FORESTS AND MINES, ONTARIO.
FIRST EDITION
SECOND EDITION
MATHESON
GERMAN
JESSOP
MURPHY
HOYLE
TURNBULL
CARSCALLEN
SHERATON
BOND
CODY
MACKLEM
NIGHT HAWK LAKE
BRITOL
OGDEN
DELORO
SHAW
CARMAN
THOMAS
Largely drift and swamp
LEGEND
GLACIAL AND RECENT
On the general map the unshaded areas are largely drift covered.
Pre-Cambrian
POST-HURONIAN
Diorite dykes and other dike rock.
These igneous rocks are intrusive into the Huronian and Keewatin of the Porcupine area.
HURONIAN
Conglomerate, impure quartzite and slatelike greywacke. This series is much more developed to the south of the area mapped.
The beds have been tilted up into a vertical position and in places have been reversed in dip. The group has a thickness of at least four hundred feet.
GREAT UNCONFORMITY
LAURENTIAN
Hornblende and biotite gneiss.
INTRUSIVE CONTACT
KEEWATIN
The series consists of amygdaloidal basalts, quartz porphyries, felsite and serpentines which have been largely altered by pressure to green and grey schists. There are also areas of iron formation, agglomerate and ferruginous dolomite. Some fragmental rocks of basaltic origin are included in this series.
Quartz-porphyry, rhyolite and grey schists.
Amygdaloidal basalt-schists, with subordinate areas of grey schists.
SIGNS
Gravel pits or sand hills.
Strike of rock.
Building.
Shaft.
Swamp.
Falls.
Water Frontage.
Rapids.
Hills.
Trails.
Roads.
Largely drift and swamp
Banks 100' high
Lake Pann Flatte
Matheson
Whitefish River
Wildfish River
Eastern River
Water Bay
Lake
Creek
Bay
Island
Point
Mine
Mines
Claim
Claims
Boundary
Line
Road
Trail
Swamp
Drift
Sand
Gravel
Hill
Rock
Rapids
Falls
Shaft
Building
Strike
Frontage
Porcupine



Map showing location of veins on Lots 10 and 11, Concession II, Township of Tisdale, Porcupine Area.
Geology by Cyril W Knight
Scale 400 ft to 1in



NOTES

By WILLET G. MILLER

THE first edition of this map, based on geological work performed during the months of May and June, was published in July, 1910. The remaining part of the summer was spent by Mr. Miller in completing the mapping of wider area, and in revising part of the work which was hurriedly done in May and June. The present map is therefore a revised and enlarged edition of the first one.

In the townships of Godfrey, Mountjoy, Tisdale and Whitney, and the north portions of Deloro and Shaw, the unsurveyed parts are largely drift covered. In the townships which are not subdivided into lots, the geological mapping was generally confined to the vicinity of the roads and lakes and rivers. During the winter of 1910-11, many other surveys have been filed, and consequently outcrops at each which have not been mapped may occur on them recently surveyed claims.

The mining claims which are not yet the names of the mining claims on the map. The names of several of the best known working properties are shown.

HISTORY OF DISCOVERIES

Until the building of the railway the Porcupine area was difficult of access and little prospecting was done in it. The information a morning it was practically all contained in the 1 parts published by the geologists who accompanied O. L. S. Niven in the years 1886, 1887, 1888, 1889, 1890, 1891, 1892 in the years 1896, 1900, 1901, 1904 and 1905. In 1886, Mr. E. M. Burwash accompanied Mr. Niven as geologist in the survey of the Nipissing-Algoma boundary line, which, it may be added, now forms the eastern boundary of the townships of Deloro and Godfrey. The boundary was run northward to mile 124, which is now situated at the southeast corner of the township of Whitney, and the eastern boundary of the township of Shaw includes that part of the boundary which was run by Niven in 1886. Mr. Burwash's description is published in Volume II of the Report of the Bureau of Mines. His notes on that line do not mention gold ores. The only gold bearing outcrops are taken from his report, pages 124 and 125, and refer to the "Dome" vein, which finally passes off the granite and intrudes upon the grey slate rocks. On the first half of the 1910-11 drive on the eastern boundary of the township of Shaw) a small quartz vein occurs which, on account of its gold content, is of interest. The district would be a promising one from the prospector's point of view were it not for the presence of the drift. In the lower parts of the series (Keewatin), on the other hand, gold bearing veins are numerous, and the rocks in which are of tolerably frequent occurrence and of mineralized portions of the rock itself . . . In two cases the veins were situated near the boundary of granite areas. In two localities, between Lake Shore and Porcupine, I found gold in small beds of the country rock, which in both cases is more or less chloritic.

In 1899 Mr. W. A. Parks reported on the geology of the district for the Bureau of Mines, and in his report, pages 37 to 39, Part II, he mentioned the occurrence of gold in traces in some of the quartz veins, and said:—"I regard the region south of the trail to Porcupine lake as giving promise of reward to the prospector." Interesting notes on the geology of the country between Lake Porcupine were later made for the Bureau of Mines by Mr. Geo. F. Kay, Mr. James C. McMillan and Mr. H. L. Keys, whose reports are published in Volumes 15, 14 and 18 respectively of the Bureau of Mines.

The first prospecting in the area appears to have been done in 1906, when a shallow pit was sunk on a claim adjacent to what is now known as the Holinger mine. The next work in the area was done in 1907 by Mr. Holinger on the eastern shore of Porcupine lake. The vein uncovered here shows gold in hand specimens. In 1909, interest was revived in the district by the discoveries of Mr. J. S. Wilson and others. Mr. James Bartlett, of Haileybury, visited the district soon after the announcement of the discoveries in October, and a report by him was shortly afterwards made public.

ROUTE TO PORCUPINE

In December, 1910, the Ontario Government authorized the building of a branch railway into Porcupine. The new line leaves the Transcontinental at Porquis Junction, 20 miles west of Cochrane, and runs due south-east nearly north of Kelso. The distance from Toronto to the junction by rail is 460 miles. The Government railway commission, which operates the T. & N. O. R., is endeavoring to have the branch line ready for operation by mid-summer, 1911.

TOPOGRAPHY

Much of the surface of the area is low and wet, although it can scarcely be said to be swampy. The lower flat surface is occupied by rich-looking clay, together with some sand and gravel. Overlying the clay in many places is a layer of peat, a few inches to a foot or more in thickness. This layer holds water, the underlying clay being impervious, and presents a surface somewhat difficult to drain. Outcrops of compact rock occur irregularly on the surface covering. Since these areas are small, they are difficult to locate. In some sections of the area the rocks rise into ridges which extend across parts of several lots. In most cases these ridges have a maximum height of more than 50 feet. Occasionally it is 100 to 150 feet.

The area lying between the mouth of Porcupine river and Porcupine lake has a maximum elevation of about 970 feet. The south-western part of the area, including Gillies hill, the hill behind the Mc Intire mine, and Schumacher, reaching an elevation of 1143 feet above sea level.

The lakes are shallow. Night Hawk lake has only a depth of only 8 feet in many parts, and a maximum depth of 12 feet in so far as is known. The greatest depth of water found in Porcupine lake was 42 feet.

GEOLOGY

The legend of this map gives the age groups of the rocks which have been recognized in the field.

KEEWATIN.—The oldest series, the Keewatin, is similar in character to rocks of this age found in various parts of northern Ontario, from the Quebec boundary on the east to that of Manitoba on the west. It consists of various volcanic rocks such as lavas and fragmental materials. These rocks have been disturbed, as is illustrated by the schistose character in many places, than it is in the Cobalt area. In the Porcupine area, however, some of the Keewatin rocks have escaped dynamic metamorphism, and still retain much of their original character. In parts of the township of Whitney and elsewhere, for instance, certain basalts still retain quite perfectly their amygdaloidal texture and ellipsoidal structure. Most of the Keewatin is dark green in color, and is composed of rocks of a colored or greenish, massive or schistose rocks of basic or intermediate composition. Quartz-porphyry is, however, a rather common rock in the Porcupine area. While it occurs characteristically in the Keewatin, it is also found in the Timiskaming in larger masses. Certain quartz-porphyry dikes have been subjected to pressure and broken up, and now resemble conglomerate. The metamorphic action has produced a dark greenish base through which the quartz phenocrysts are scattered. These volcanic fragmental rocks of Keewatin age occur in the area, but they have not been definitely recognized.

Associated with the Keewatin, especially in the vicinity of Porcupine lake, there is found what is a much less formation. This area formation is what is commonly called jaspilyte, and consists of alternate thin bands of magnetite and silica, the latter being frequently red in colour. Many of the bands of magnetite are somewhat impure, containing calcite, dolomite or a ferruginous carbonate. In some parts of the area are masses of rocks essentially composed of these minerals, giving rise to crystalline limestone which is usually very coarse-grained. Such a mass occurs on the north-west quarter part of lot 10 in the 11th concession of Whitney township. The outcrop covers an area of 15 to 20 acres and is not seen in contact with other rocks. It may correspond in age to the crystalline limestone which occurs in the township of Deloro in the vicinity of the Dome mine but there is no outcrop of a ferruginous carbonate. It would appear certain that carbonate minerals in some places is a replacement mineral, and that a considerable volume of rock may in this way have become changed. In the Keewatin area is found serpentinized basalts that in rock mining occur as veinlets in a few cases. For instance, the strong vein on the West Dome and adjacent claims is composed of a ferruginous carbonate that has been fractured and filled in with quartz; an analysis of this carbonate shows it to be composed of carbonates of Ca, Mg, Fe, Mn (Fe Mg O, 14.20%; Fe O, 6.06%; C O_2, 45.14%). A somewhat similar carbonate occurs in a vein on the Grey claims in the township of Tisdale and on analysis shows its composition to be Ca O, 29.33%; Mg O, 20.87%; Fe O, 6.06%; C O_2, 34.50%).

THE HURONIAN in this area has been subjected to intense dynamic metamorphism, and it is difficult to distinguish Huronian schist or other highly metamorphosed rocks of this age from the Keewatin. In the Porcupine area, as in many other places, one of the most difficult problems of the pre-Cambrian is to distinguish true fragmental, especially conglomerates, from various fragmental material, or from friction breccias which are common in the vicinity of fault planes. In this area the subdivision each of these three classes—(1) true conglomerates, (2) volcanic fragmental material, (3) friction breccias or autoclastic rocks, may be present. Thus the pre-Cambrian geologist may be excused if he makes a mistake.

LAURENTIAN.—About 10 miles to the south-east of Porcupine lake areas of hornblende granite are frequently seen. This granite invades the Keewatin. In a patch of conglomerate on the south line of Langmuir township, pebbles of hornblende granite occur, proving the existence of a granite area of pre-Huronian age. This granite is somewhat fine grained. Similar granite, occur in the southern part of Whitney township; it invades the Keewatin series, but its relation to the Huronian has not been determined.

HURONIAN.—A belt of Huronian fragmental rocks, that outcrops through the drift covering at irregular intervals, has been traced from near the mouth of the Porcupine river in the township of Whitney, across the northern part of the township of Whitney and southward through the dale, Tisdale and Langmuir townships. These conglomerates on the south line of Langmuir township and on the northeast bay of Night Hawk lake. As previously mentioned, the Huronian has been subjected to great metamorphism and in many places it is difficult to distinguish it from a metamorphism has in a striking contrast to that of the same series in the Cobalt, Gowganda and other areas to the southward.

The three belts of the series characteristic of the Huronian are found in the Porcupine area. There is conglomerate, impure quartzite or more massive greywacke and well-banded slate-like greywacke. Where the Huronian rocks have been rendered schistose, their recognition is assisted by the presence of the pebbles. In the Porcupine area cases, as has been said above, to distinguish metamorphic conglomerate from volcanic fragmental or autoclastic rocks, but the more distinctive facies of the Huronian tend to retain their original characteristics, even when they have been put to a schistose fire, or contact with, Keewatin rocks.

OLDHAM DIABASE.—Several dikes of olivine diabase and other basic rocks, cutting the Keewatin, have been found in the area. Some of these dikes are of the same age as the Nipissing diabase of the Sudbury area and are similar to those that have been found in the Cobalt and Gowganda areas. The olivine diabase in the Porcupine area is considered to be of post-Middle Huronian age.

PLEISTOCENE DEPOSITS.—Drift.—It is not necessary to say more concerning the glacial and recent deposits of the district than has been said in previous parts of this series.

ORE BODIES

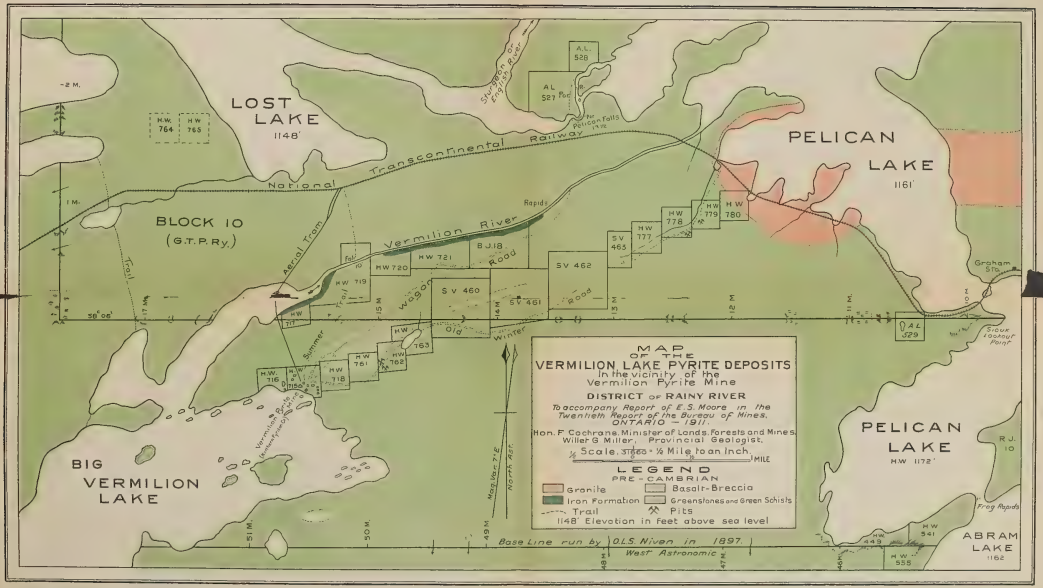
Outcrops of quartz veins numerous in the area mapped. The veins are found in rocks of both Keewatin and Huronian age. Whether Keewatin or Huronian, there will appear to be very little difference in the character of the veins, either as to form or as to gold content.

The writer has had the opportunity of visiting the deposits of the Porcupine district, and is convinced that the gold deposited from the solutions which took place in the Keewatin and under great pressure, and that the rocks after the deposition of the quartz veins give evidence of having been subjected to great pressure and the quartz veins themselves have been fractured, and the gold deposited in the quartz has been found in a few cases to be somewhat coarse.

The detailed maps of Messrs Knight and Burrows, which accompany this report, will be found to be consistent, that the ore occurs across the strike of the veins, and that they vary considerably in width. This is characteristic of veins in the Cobalt area. Veins from a few inches to 4 feet in width, and narrower stringers (Fraser) veins, mentioned in the quartz veins or deposits in which valuable ores have been made.

DETAILED MAPS

The detailed maps of the Holinger and neighboring properties show the veins in plan, and also the strike in these veins. The metamorphism of some of the rocks, especially the porphyries, and the impregnation of the veins with carbonate minerals, have resulted from the deposition of the gold. Many of the veins carry considerable quantities of carbonate material, the principal constituents of which are shown on the map. The Dome mine, for instance, is a quartz vein carrying carbonates of iron, lime and magnesia. The West Dome vein, as shown on the above, differs from the Dome vein in that it carries a greater proportion of carbonate of lime and magnesia than the Dome vein does. The Holinger vein is a quartz vein carrying carbonates of iron, lime and magnesia. The Holl


LOST LAKE
1148'
PELICAN LAKE
1161'
BLOCK 10
(G.T.P. Ry.)
BIG VERMILION LAKE
PELICAN LAKE
H.W. 1172'
ABRAM LAKE
1162
National Transcontinental Railway
Vermilion River
Aerial Tram
Trail
Road
Winter
Summer
Graham Station
Sioux Look-out Point
Frog Rapids
Rapids
Stubbs Falls
Vermilion Falls
Vermilion Portage
(to Lower Vermilion)
A.L. 528
A.L. 527
A.L. 529
H.W. 764
H.W. 763
H.W. 720
H.W. 721
H.W. 719
H.W. 718
H.W. 716
H.W. 751
H.W. 782
H.W. 777
H.W. 778
H.W. 779
H.W. 780
S.V. 460
S.V. 461
S.V. 462
S.V. 465
B.J. 18
B.J. 10
R.J. 10
H.W. 541
H.W. 555
H.W. 449
-2 M.
1 M.
38° 00'
Base Line run by O.L.S. Niven in 1897.
West Astronomic
MAP
OF THE
VERMILION LAKE PYRITE DEPOSITS
In the vicinity of the
Vermilion Pyrite Mine
DISTRICT OF RAINY RIVER
To accompany Report of E.S. Moore in the Twentieth Report of the Bureau of Mines, ONTARIO - 1911.
Hon. F. Cochrane, Minister of Lands, Forests and Mines.
Willet G. Miller, Provincial Geologist.
½ Scale, 1760 = ¼ Mile to an Inch. ¼ MILE
LEGEND
PRE-CAMBRIAN
Granite
Basalt-Breccia
Iron Formation
Greenstones and Green Schists
Trail
Pits
1148' Elevation in feet above sea level

MAP
OF THE
SILVER MOUNTAIN AREA
DISTRICT OF THUNDER BAY

TO ACCOMPANY REPORT OF N. L. BOWEN IN THE TWENTIETH REPORT OF THE BUREAU OF MINES, ONTARIO 1911

Hon. F. Cochrane, Minister of Lands, Forests and Mines.
Willet G. Miller, Provincial Geologist.

Scale: 63360 = 1 Mile to an Inch.

1 0 1 2 3 4 Miles

C.N.Ry. to Fort Frances and Winnipeg

Kashabowie

Whitefish River

Vermilion River

Vermilion Lake

Port Arthur

Duluth

Whitefish Lake
El. 1330'

MARKS

O'CONNOR

PAIPOONGE

STRANGE

LYBSTER

GILLIES

SCOBLE

FRALEIGH

PEARSON

Oliver Lake

Picture Lake

Silver Creek Station

Hymers Station

Canadian Northern Railway

Wabigoon River

Wabigoon

Wabigoon Lake

Silver Mountain

Rabbit Mt.

Vertical Scale :— 1600 feet to the Inch

Vertical Scale Approximate

Note : The Horizontal Scale of Sections corresponds with that of the general Map

LEGEND

PLEISTOCENE
- Drift

KEWEENAWAN
- Diabase

ANIMIKIE
- Grey Quartzite
- Black Slate
- Iron Formation

LAURENTIAN
- Gneiss

Note: The sedimentary exposures (Animikie) on steep hillsides are hardly sufficient to show on a map of this scale. However, on account of their importance, they are plotted on an exaggerated scale and therefore encroach on the drift-covered areas.

SIGNS

- Wagon Road
- 1330 Altitude above Sea Level
- Swamp
- Hill
- Section Lin

— Sources of Information —

Geology, Section and Topography of the contoured area by D. Ingall of the Geological Survey of Canada 1887. Geology of remaining part by N.L. Bowen. Plans of Survey from the Department of Lands, Forests and Mines, Ontario. Compilation by W.R. Rogers.

— Mining Locations —

O'CONNOR
- 87 T. Beaver
- 88 T. Beaver
- 148 T. West Beaver

GILLIES
- 94 T. Silver Creek
- 38 T. Porcupine
- 201–202 T. Badger

LYBSTER
- 836 West End Silver M.

SCOBLE
- 39 T. Rabbit Mountain

THE COMM. CLAIM CO. LTD. LITHO. TORONTO


MAP
OF THE
STURGEON LAKE GOLD FIELD
DISTRICT OF THUNDER BAY—ONTARIO
To accompany Report of E. S. Moore,
in the Twentieth Report of the Bureau of Mines, 1911.
Hon. F. Cochrane, Minister of Lands, Forests and Mines
Willet G. Miller, Provincial Geologist
Scale: 1320 = 40 Chains to 1 Inch
LEGEND
PRE-CAMBRIAN
Quartz-Porphyry.
Younger than the granite.
Sturgeon Lake Granite
Biotite granite and quartz grading into granitic porphyry and porphyritic granite; cut by pegmatite and a few basic dykes. Probably the youngest member of pre-cambrian rock; grey gneiss of Keewatin age.
Hornblende Syenite
Agglomerate and Breccia
Quartz-Porphyry and Rhyolite
Includes numerous small areas of porphyrite and diabase, which are probably of the same age and some of it younger than the Sturgeon Lake Granite.
Green Schists and Greenstones
Chiefly basic lavas, with some areas of acid porphyrite; sometimes to chert, jasperoid, siliceous, fluorite, and pyritic schists. Probably some of these rocks are possibly much older than Keewatin.
Post-Keewatin
Laurentian?
Keewatin
SIGNS
Glacial Striae
Strike of Rocks
Camp
Shaft
Stripping, Test-pit or Tunnel
Trail, Portage, or Road
Altitude in feet above sea level.
Six miles to District Boundary between Rainy River and Thunder Bay
Outlet Creek from L. 681 (1025) on National Transcontinental Ry
Sturgeon Lake
Transport Lake
Sturgeon Lake Trg Co
Sturgeon Lake
Bay
Lake
Water Road
St Anthony Camp
St Anthony Arm
Sturgeon River
Island
Sturgeon River
Camps
Cache
Sturgeon
North
Bay
East
Bay
Island
Kipigon Bay
N. & N.W. Power Co.
Kipigon Bay
Trans
Sturgeon Lake
Sturgeon River
Sturgeon
North
Bay
East
Bay
Island
Covey
Ring Bay
Sand Pile
T. Sturgeon Lake Road and P.O.
T. & N.O. Ry. Co. Station
Abandoned
Lorain Store
Dr. McCauley Lake
Dr. McCauley Lake
Dr. McCauley Lake

ROUTE MAP
OF PARTS OF
THE MOOSE RIVER TRIBUTARIES
DISTRICTS OF ALGOMA, SUDBURY, & NIPISSING.

TO ACCOMPANY REPORT BY W. G. MILLER, ON
"The Iron and Lignite of the Mattagami Basin
In the Thirteenth Report of the Bureau of Mines, Ontario, 1904
Hon. F. Cochrane, Minister of Lands, Forests and Mines.
Wilfrid G. Miller, Provincial Geologist.

Scale: 40 chains = 4 miles to one inch.



Approximate

SILURIAN and DEVONIAN

between

LAURENTIAN and Archean

MOOSE RIVER

FRENCH RIVER

MISSINAIBI RIVER

MATTAGAMI RIVER

ABITIBI RIVER

OPASATIKA RIVER

BOUNDARY

ALGOMA

SUDBURY

NIPISSING

GNEISS

GNEISS

MAIN

RIVER

GROUNDHOG RIVER

MACMAHON

NEELY

NIXON

PEARCE

TORRANCE

MCRAE

TOMSTON

WILLIAMSON

TEETZEL

GURNEY

BEARDMORE

O'BRIEN

FAUQUIER

MACHIN

ALEXANDRA

SWANSON

NANSEN

SNACKLETON

HOAGART

COLQUHOUN

LEITCH

SYDERE

CLUTE

GLACKMEYER

KENNEDY

LAJOLAIE

MABEE

LABADIE

LEVACK

GYATAWA

FOURNIER

LANDRIGAN

FOX

STINSON

NOTES

Within the area marked Ambrosa are found, for the most part, pink granites, syenites, and their gneissoid representatives. Frequently these are cut by narrow diabase dikes, a few calcite veins occur in the dikes but they do not carry values such as are found in the Cobalt and Gowganda veins. With the exception of the agricultural areas the topography of the Ambrosa is rough and broken. North of the height-of-land, as soon as the Keewatin rocks are met with, lakes are fewer and smaller, and the country is more open.

The Paleozoic areas are chiefly Silurian and Devonian limestones. About the edges of these Ambrosa are many portals, basins and irregular channels now filled with limerock. Practically the whole area is drift-covered; and beds of lignite, usually crushed and disturbed, are found in the drift. However, a few outcrops are larger and of fair quality. Most of the lignite is low-grade and slaky on exposure to the air. The upper soil is a good clay loam and when drained will be well suited to agriculture. The timber is more scattered as James Bay is approached; it is also smaller in size. There are areas of poplar-and, however, along the southern fringe of the Paleozoic.

LEGEND

SILURIAN and DEVONIAN
Limestones, shales and sandstones
UNCONFORMITY
Pre-Cambran
DIABASE INTRUSIVES.
INTRUSIVE CONTACT
LAURENTIAN
Gneisses, syenites and granites.

— SIGNS —

- Trig. sta.
- Iron
- Gypsum
- Trail or Portage
- Rly. ↑
- T.C.
- N.S.
- Swamp
- 715 Elevation above Sea Level
- B.H. Boring Permit, Sudbury Mining Division
- B.P.T. Boring Permit, Timiskaming Mining Division
- Camp or Cabin
- P. Portage Creek
- H.W. High Water Mark
- 1 ½ Mile

— SOURCES OF INFORMATION —

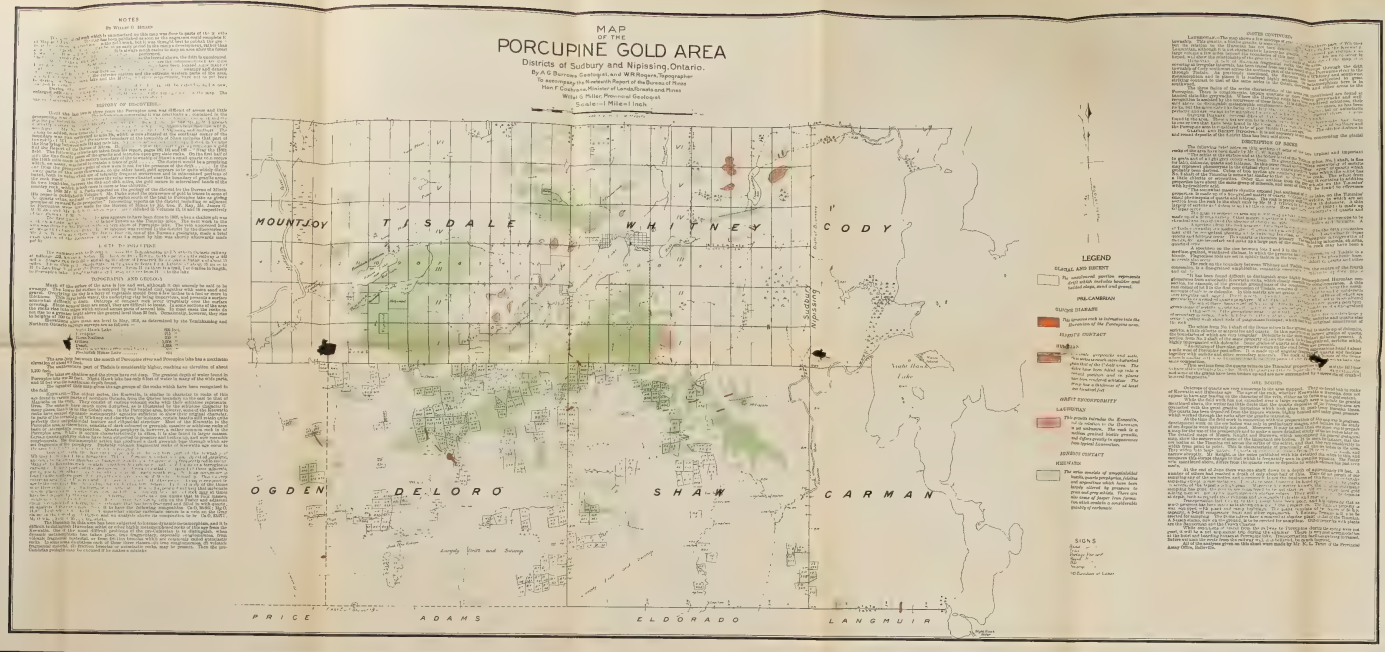
Route sketch of the Mattagami, Kapuskasing and Groundhog rivers, north of the Transcontinental Railway, by M. B. Baker.

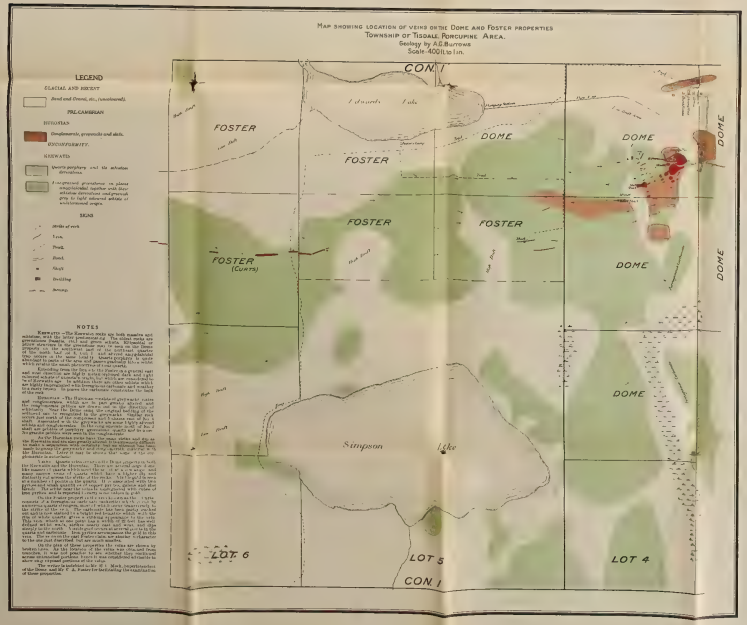
Notes on the Opasatika, Kapuskasing and Groundhog rivers south of the railway are taken from the Northern Ontario Exploration Report of 1905.

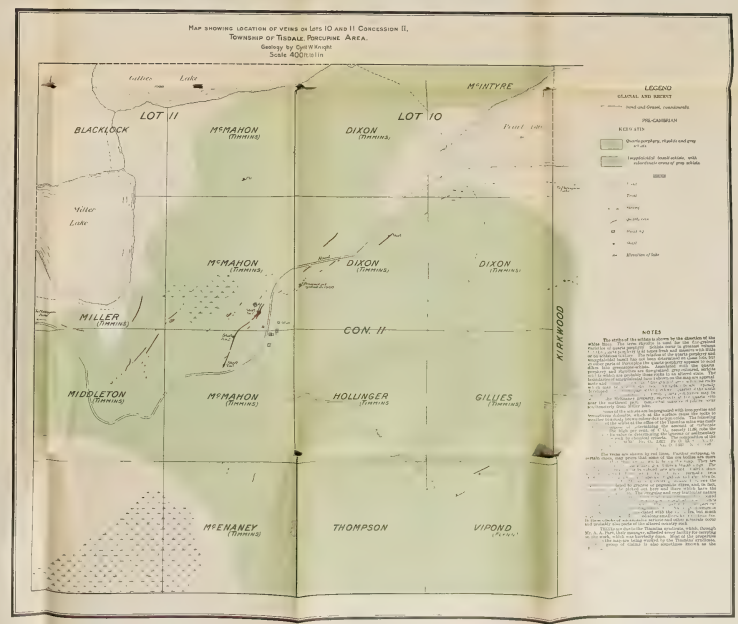
Plans on record in the Bureau of Mines and Surveys Branch, Department of Lands, Forests and Mines.

Compilation by W. H. Rooney, Topographer.

NOTE.—The position of the rivers is not absolute except where they are crossed by surveyed lines and through established townships. The lakes have been outlined, or determined, by sketch; and in some cases the different surveyors do not agree in their observations.


MAP
OF THE
PORCUPINE GOLD AREA
Districts of Sudbury and Nipissing, Ontario.
By A.G. Burrows, Geologist, and W.R. Rogers, Topographer
To accompany the Sixteenth Report of the Bureau of Mines
Hon. F. Cochrane, Minister of Lands, Forests and Mines
Willet G. Miller, Provincial Geologist
Scale—1 Mile = 1 Inch
NOTES
HISTORY OF DISCOVERIES.
GENERAL GEOLOGY.
DESCRIPTION OF ROCKS
MINERALIZATION AND ORE-DEPOSITS.
LEGEND
GLACIAL AND RECENT
PRE-CAMBRIAN
SIGNS
MOUNTJOY
TISDALE
WHITNEY
CODY
OGDEN
DE LORO
SHAW
CARMAN
PRICE
ADAMS
ELDORADO
LANGMUIR


Map showing location of veins on the Dome and Foster properties
Township of Tisdale, Porcupine Area.
Geology by A.G. Burrows
Scale 400ft to 1in.
LEGEND
NOTES
CON. I
FOSTER
DOME
FOSTER (Curts)
Simpson Lake
LOT 6
LOT 5
LOT 4
CON. I
KEY PLAN
Showing relative position of the
PORCUPINE GOLD AREA


Map showing location of veins on Lots 10 and 11 Concession II,
Township of Tisdale, Porcupine Area.
Geology by Cyril W. Knight
Scale 400ft to 1in
LEGEND
NOTES
LOT 11
LOT 10
McINTYRE
BLACKLOCK
McMAHON (TIMMINS)
DIXON (TIMMINS)
MILLER (TIMMINS)
CON. II
MIDDLETON (TIMMINS)
HOLLINGER (TIMMINS)
GILLIES (TIMMINS)
KIRKWOOD
McENANEY (TIMMINS)
THOMPSON
VIPOND (TIMMINS)

PROFILE

FROM

Toronto to the Archean–Paleozoic boundary on Hudson Bay Slope.

To Accompany the

Nineteenth Report of the Bureau of Mines, Ontario.

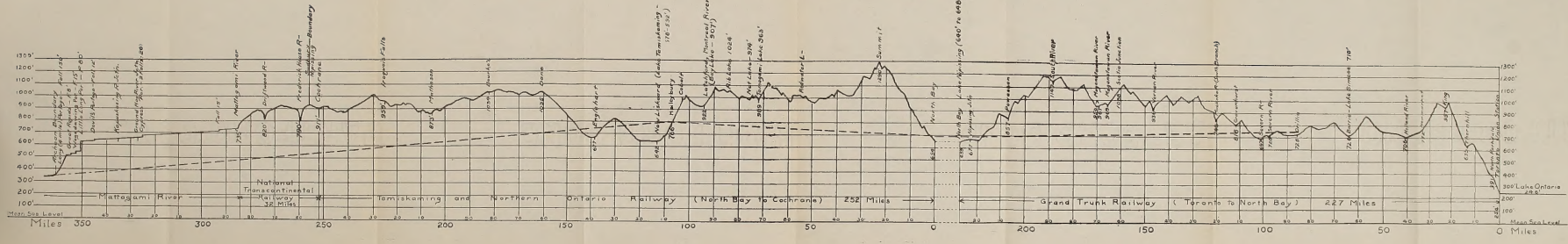
1910

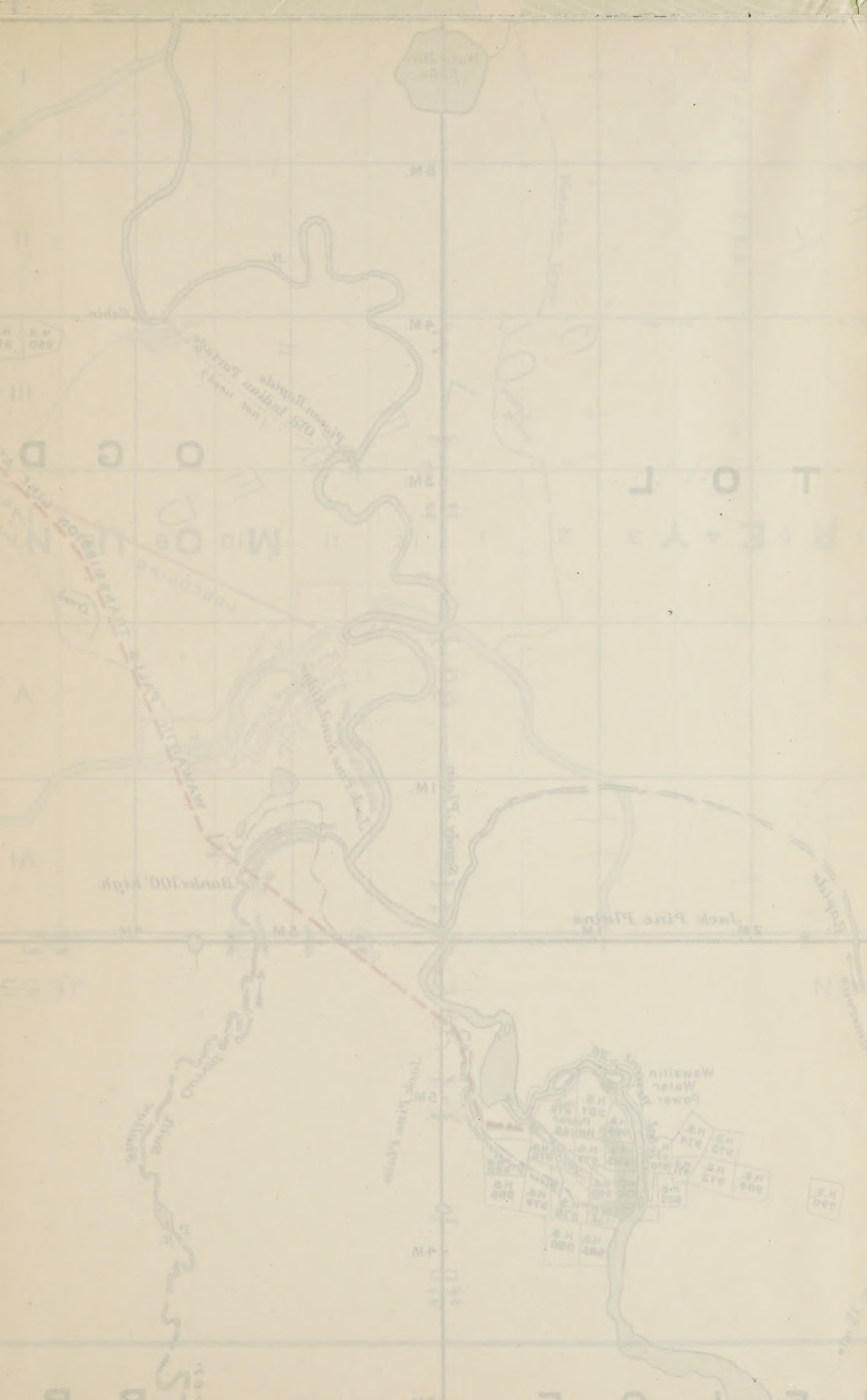
Willet G. Miller, Provincial Geologist. W. R. Rogers, Topographer.

Scale: { Horizontal—20 miles=1 inch. Vertical—400 feet=1 inch.

Sources of Information:—"Altitudes in Canada" by Jas. White. Profiles of the Grand Trunk, Temiskaming and Northern Ontario, and National Transcontinental Railways. The section showing the Mattagami River is approximate, having been compiled from various sources, and some of the data is conflicting.

Notes:— The profile connects four Paleozoic areas. The northern edge of the Lake Ontario area is in the vicinity of Orillia. Smaller areas or outliers are found at Lake Nipissing and at Lake Temiskaming. The north end of the profile shows the location of the southern edge of the James Bay area. With the exception of the outliers at Lakes Nipissing and Temiskaming the profile crosses pre-Cambrian areas. The profile is instructive in that it brings out the plain-like character of the pre-Cambrian region.


Mattagami River
National Transcontinental Railway 32 Miles
Temiskaming and Northern Ontario Railway (North Bay to Cochrane) 252 Miles
Grand Trunk Railway (Toronto to North Bay) 227 Miles
Miles 350 300 250 200 150 100 50 0
200 150 100 50 0 Miles
Mean Sea Level
300 Lake Ontario 246
Mattagami River
Groundhog River
Frederick House R.
Sturgeon River
Montreal River
Lake Temiskaming (Lake Timiskaming 170–242)
Lake Nipissing (680 to 685)
Lake Nipissing
Trout Lake 376
Wanapitei Lake 363
Mattawa
Sturgeon River
Wahnapitae River
Sudbury
Cartier
Coniston
Copper Cliff
Creighton
Falconbridge
Onaping
Onaping Falls
Dunlop
Dane
Englehart
Cobalt
Haileybury
Temiskaming
Latchford
Thornloe
Ferguson
Hudson
Jamieson
Gillies
Lorrain
Dack
Dymond
Dalton
Hoyle
Ramore
Timmins
Porcupine
Iroquois Falls
Kelso
Smoothrock
Fauquier
Abitibi
Abitibi Canyon
Abitibi Falls
Sesekinika
Frederick House R.
Sandy Inlet
Cochrane
Matheson
Moonbeam
Opasatika
Kapuskasing
Val Rita
Val Rita
Val Rita



BINDING SECT AUG 2 4 1967